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PE902654

ATTACHMENT 1 - MUD LOGGING REPORT SEPARATE
(PE906018)

WCR (vol. 2)
KAHAWAI - 1

ESSO EXPLORATION AND PRODUCTION
AUSTRALIA INC.

OIL and GAS DIVISION

WELL COMPLETION REPORT

KAHAWAI - 1

VOLUME 2

0 2 MAY 1983

GIPPSLAND BASIN
VICTORIA

ESSO AUSTRALIA LIMITED

Compiled by : G. Lindsay

January, 1983

KAHAWAI-1

WELL COMPLETION REPORT

VOLUME II

(Interpretative Data)

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* SEPARATE DOCUMENT STORED IN BOX PE180184

GEOLOGICAL AND GEOPHYSICAL ANALYSIS

AGE	UNIT/HORIZON	DEPTH (m) PREDICTED KB	DRILLED KB	DRILLED SUBSEA	THICKNESS(m)
Recent to Miocene	Gippsland Limestone	80	80.5	59.5	1005.5
Miocene	Lakes Entrance Formation	1036	1086	1065	304
	LATROBE GROUP				
Eocene	Gurnard Formation	1393	1390	1369	10
Eocene	Flounder Formation	1398	1400	1379	68
Eocene	Base of Tuna-Flounder Channel	1431	1468	1447	
Palaeocene	Mid-Palaeocene Marker	1926	1925	1904	
	TOTAL DEPTH	2271	2320	2299	

INTRODUCTION

Kahawai-1 was drilled primarily to assess the hydrocarbon potential of an erosional high of westerly dipping lower *M. diversus* to upper *L. balmei* age Latrobe Group sediments between the Tuna - Flounder and Marlin Channels. The closure was interpreted to be sealed by shales of the Tuna-Flounder Channel fill (Flounder Formation). The secondary objective was to delineate the western extent of the Tuna M-1.2 reservoir.

PREVIOUS DRILLING HISTORY

No previous wells have been drilled on the Kahawai Prospect. The nearest wells are the Tuna Field exploration and development wells several kilometres to the east, Batfish-1 6km to the southeast, Morwong-1 7km to the southwest and Turrum-1 11km to the west.

STRUCTURE

The Kahawai Prospect is a subunconformity closure in which westerly dipping Latrobe Group sediments of M. diversus and Upper L. balmei age are truncated to the east by the Tuna-Flounder Channel and to the west by the Marlin Channel (Enclosure 4). The eastern extremity of the prospect extends beneath the Tuna M-1.2 reservoir. Post-drill mapping shows that the Kahawai closure is still present but smaller than previously interpreted (Enclosure 2).

STRATIGRAPHY

The Kahawai-1 well penetrated the expected Gippsland Limestone and Lakes Entrance Formation and encountered the top of the Latrobe Group, Gurnard Formation at -1369m. Palynological and palaeontological evidence (Appendices 1 and 2) suggests that a time break exists between the Latrobe Group, which terminates at the end of the Eocene, and the Lakes Entrance Formatiom, commencing within the early Miocene (Figure 1). Sampling may not, however, have been sufficient to determine whether there was a time break or a highly condensed sequence.

The Gurnard Formation consists of a glauconitic, silty sandstone of Lower and Middle N. asperus age to a depth of -1379m. The base of the formation contains a lag deposit which marks the commencement of the final marine transgression which terminated the Latrobe Group sedimentation.

Beneath the Gurnard Formation, the P. asperopolus age Flounder Formation is composed of almost 100% quartz sandstone to a depth of -1447m. It was expected that the basal part of the Flounder Formation would consist of shale similar to that which was found in Tuna-3 and Tuna-A9. Had this shale channel fill been present at Kahawai it would have provided a seal for the underlying Latrobe Group sediments.

The base of the Tuna-Flounder Channel is marked by the change to the coal rich sequence of M. diversus age, which extends to a depth of about -1534m.

The strata of L. balmei and T. longus age intersected in the well below -1534m, consist of interbedded sandstone, shale and coal. The percentage of coal decreases down hole. Core number 3 from -1524.2m to -1537.2m suggests that there was a strong marine influence on the L. balmei sedimentation.

The mid-Palaeocene marker was intersected at -1904m and consisted of a group of several thick coal seams underlain by an interpreted marine sequence of up to 35 metres thickness.

HYDROCARBONS

Tuna M1.2 Reservoir

The Tuna M1.2 reservoir is a substantial gas accumulation with an 11 metre oil leg. Tuna well data has been used to determine a gas-oil contact of -1377.5m and an oil-water contact of -1388.5m.

In Kahawai-1 the Tuna M1.2 hydrocarbon accumulation was penetrated beneath the Gurnard Formation as expected. Hydrocarbon shows were encountered in sidewall cores and cores from -1374.0m to -1392.6m. Log analysis, however, indicates an oil column from -1380.5m to -1391.0m. The log interpreted oil-water contact of -1391.0m is in agreement with the contact determined from pressure data. This places the oil-water contact for the M1.2 reservoir in Kahawai-1 about 2.5 metres deeper than that determined from the Tuna wells.

Kahawai Prospect

No hydrocarbon shows were found in the primary target beneath the Eocene channelling. The Eocene channel was filled with a clean sandstone rather than the predicted shale, therefore, no seal was present over the Kahawai prospect.

GEOPHYSICAL ANALYSIS

Kahawai-1 intersected the top of Latrobe Group and "coarse clastics" seismic markers as predicted. The base of the Tuna-Flounder channel was intersected 37m deeper than predicted. Because of this, some 130km of migrated G76A, G81A and G82B seismic data, tied to Kahawai-1, Tuna-2 and the Tuna field mapping, were incorporated into the remap of the base of the Tuna - Flounder channel (Figure 3)..

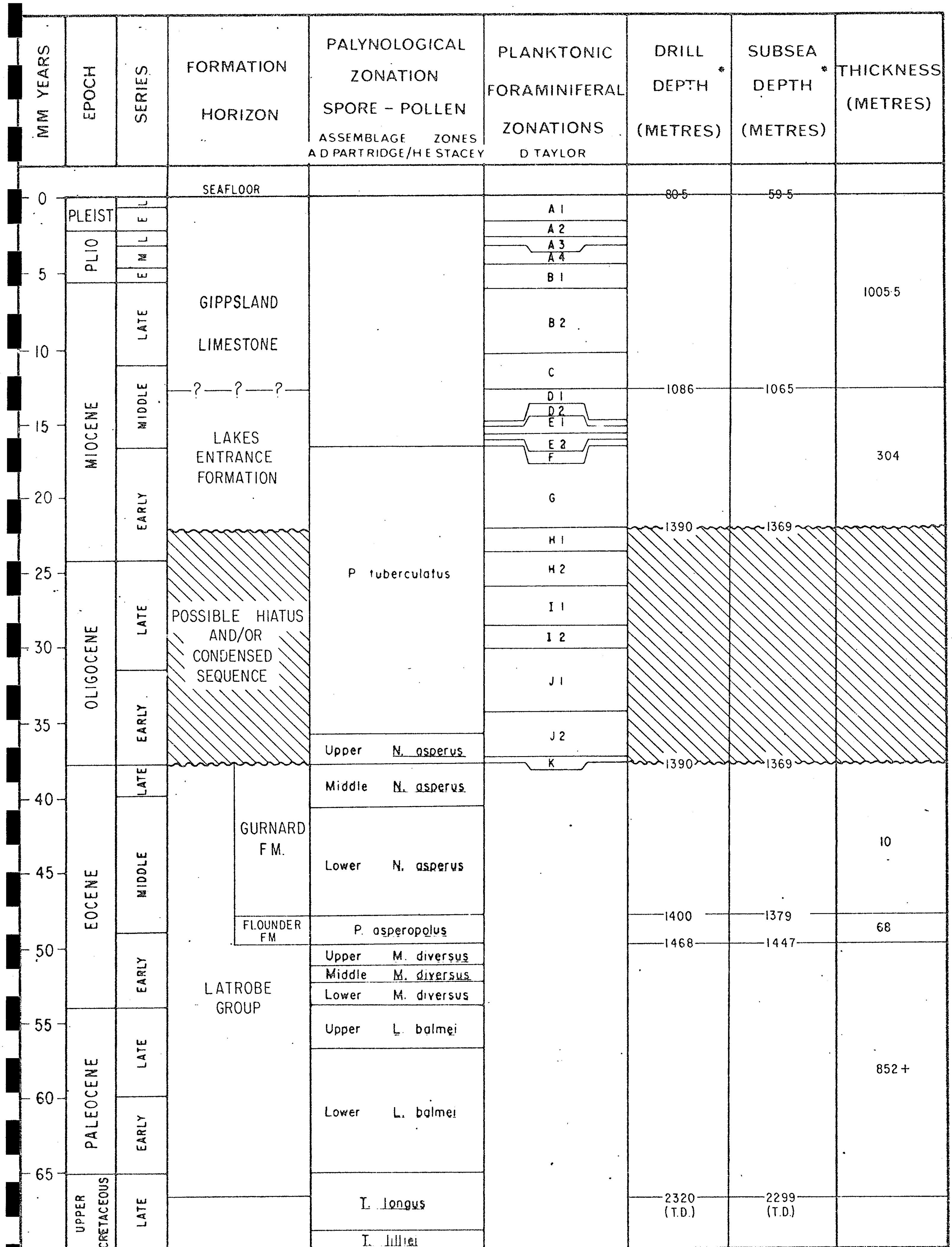
Check-shot, sonic log and synthetic trace data all indicate that the strong peak at 1.21 sec (Line G82B-6013) at the Kahawai-1 well location better represents the channel surface than the peak at 1.19 sec which was originally mapped. Nevertheless, Kahawai-1 tested a closure at this level.

The synthetic trace best fits the seismic with an acoustic impedance increase represented as a trough and a lag of -10 millisec. There is a small but significant acoustic impedance decrease at 1468mKB and a much larger decrease at 1474mKB associated with the first major coal below the channel. The two interfaces are separated by 2 millisec. sonic travel time, and both undoubtedly contribute to the peak at 1.21 sec. There is some question as to which interface actually represents the channel surface, but as the most prominent feature on electric logs is at 1468m KB, the tie was made there.

Figures

FIGURES

KAHAWAI-1
STRATIGRAPHIC TABLE



* Depths are True Vertical Depths

se Dwg. 1107/OP/149

Dwg. 2096/OP/

APPENDIX 1

APPENDIX 1

MICROPALAEONTOLOGICAL ANALYSIS

APPENDIX-1

MICROPALAEONTOLOGICAL ANALYSIS OF KAHAWAI-1

GIPPSLAND BASIN, VICTORIA

by

M.J. HANNAH

Esso Australia Ltd

Palaeontological Report 1982/33 October 13, 1982

0194L

PART-1

INTERPRETATIVE DATA

INTRODUCTION

GEOLOGICAL SUMMARY

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SUMMARY TABLE

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INTRODUCTION:

The planktonic foraminiferal content of thirty-three sidewall cores has been examined. The greatest sample density occurs over the interval containing the top of the Latrobe Group and the basal Lakes Entrance Formation; nevertheless the remainder of the marine section, up to the base of the casing shoe is well sampled.

Except where affected by recrystallization, preservation and yield of microfossils was good to excellent throughout the well. This standard of preservation allowed, in most cases, zonal identifications to be made with a high degree of confidence. Recrystallization is only a problem immediately above the top of the Latrobe Group and for about 100 metres below final sample.

The planktonic assemblage, prior to Zone D1 is fairly diverse with a high proportion of keeled forms. This high diversity is probably a result of the deeper water environment through this part of the Tertiary. In this regard Kahawai-1 contrasts sharply with shallower water sections such as is found at Seahorse-2 which contains only a limited globigerinid fauna with no keeled forms. (Hannah in prep.).

As discussed below (Biostratigraphy Section) a general decline in species diversity is expected across the D2/D1 boundary. This combined with the poorer preservation of material accounts for the decrease in diversity at the top of the section.

Biostratigraphic dating reveals that most samples form a consistent pattern of ages ranging from the Early Miocene (Zone G) to the Mid Miocene (Zone C). The section appears to be continuous (see below - Geological Comments).

GEOLOGICAL SUMMARY

KAHAWAI-1

AGE	FORMATION/LITHOLOGY	ZONE	DEPTH (m)
RECENT TO MIOCENE	GIPPSLAND LIMESTONE Not sampled		Seafloor-950.0
MIDDLE	Recrystalization increasing and preservation decreasing up section	C	950.0-1070.1
MIOCENE	LAKES ENTRANCE FORMATION Residues consist almost entirely of well preserved foraminiferal tests	D-1	1090.2-1110.0
		D-2	1130.0-1270.3
?		E-2	1324.9
EARLY		F	1339.9-1376.2
MIOCENE	Recrystalization of carbonate, preservation poor - distinct log signature.	G	1379.2-1387.0
	LATROBE GROUP Gurnard Formation. Fine grained quartz sand - slightly glauconitic and micaceous	?	

Unfortunately two sidewall cores appear to be misplaced as their determined ages do not fit the perceived pattern (SWC Nos 112 and 113, see Summary Table 2 and Biostratigraphy Section). The misplacement of these two sidewall cores implies that the depths of the remaining samples must be treated with some degree of caution.

GEOLOGICAL COMMENTS

(a) There appear to be no breaks in the section studied. The lack of Zone E1 and the thinness of E2 is probably a result of the large sampling interval in this part of the section.

(b) The Gurnard Formation in Kahawai-1 consists of ten metres (1400.0 to 1390.0 metres) of fine grained quartz sand which is occasionally glauconitic and often contains pyrite and mica. It is not a greensand as is found in many other Gippsland Basin wells. This unit is marked, top and bottom by distinct log breaks.

No in situ planktonic foraminifera have been found in this interval, making age determination impossible. Very rare agglutinated foraminifera are found in sidewall core 110 at 1392.0 metres. Well preserved planktonic contaminants occur in sidewall cores 63 and 65 at 1396.1 and 1394.0 metres respectively. Two species are involved; Orbulina universa and Globoquadrina dehiscens, both are well below the base of their ranges.

(c) The transition from Latrobe Group sediments to those of the Lakes Entrance Formation is marked by a change in lithology of fine grained quartz sand to a strongly recrystallized carbonate. Recrystallization of material from sidewall core 71 at 1388.1 metres, immediately above top of Latrobe is so intense that no foraminifera could be recognised. Up section recrystallization ameliorates; first foraminifera are found in sidewall core 72 at 1387.0 metres, and by sidewall core 76 at 1379.2, a well preserved fauna was recovered. The whole interval is confidently dated as Early Miocene (Zone G - see Biostratigraphy Section). The recrystallization of the carbonate produces a distinct log signature which is most noticable on the resistivity logs.

(d) The distinction between the Lakes Entrance Formation and the Gippsland Limestone was impossible to pick using the washed residues. This boundary, however, is tentatively placed at the log break at 1086.0 metres. Above this level preservation deteriorates due to increasing recrystallization.

BIOSTRATIGRAPHY

The zonal scheme is that of Taylor currently in use in the Gippsland Basin.

Taxonomic note: Since the preparation of the range chart the taxonomic standing of two species used has altered. Both Globorotalia siakensis and Globorotalia continuosa are now considered junior synonyms of Globorotalia mayeri (Bolli and Sanders 1982). Whereas Globorotalia siakensis and Globorotalia continuosa are listed on the range chart, Globorotalia mayeri is used in this report.

Zone G - Early Miocene (1387.0 - 1379.0 metres)

The presence of Globigerinoides quadrilobatus trilobus without Globigerinoides sicanus in sidewall cores between 1387.0 and 1379.0 metres enable this interval to be assigned to Zone G (Early Miocene). Typical constituents of a Zone G Assemblage, including Globigerina woodi, Globigerina woodi connecta and both the sensu lato and sensu stricto forms of Globoquadrina dehiscens, are common throughout this interval.

Zone F, Early Miocene (1376.2 - 1339.9 metres)

There is little or no change in the foraminiferal assemblage between Zones G and F. The base of the latter zone is recognised by the first appearance of Globigerinoides sicanus in sidewall core 77 at 1376.2 metres. Most samples from this interval contain a highly diverse, well preserved fauna and the zonal assignment carries a high degree of confidence.

One exception to this is sidewall core 79 at 1369.0 metres which lacks Globigerinoides sicanus. If not for this sample's position in the section it would be assigned to Zone G. However the sample is considered to be in place since the preservation, yield, and diversity of its fauna is identical to samples on either side.

A similar non-appearance of Globigerinoides sicanus in sidewall core 113 offers an alternative explanation as to why this sample appears to be out of sequence. However, the diversity, yield and preservation of this sample's fauna sets it apart from other Zone F samples.

The patchy distribution of _Globigerinoides_ _sicanus_ is common in the Gippsland Basin. The late occurrence has, on some occasions caused the top of Zone G to be placed too high.

Zones E2, Early Miocene (1324.9 metres)
The occurrence of well developed _Praeorbulina_ _glomerosa_ in sidewall core 115 without _Orbulina_ in either its _universa_ or _suturalis_ forms fixes this sample's age as Zone E2.

Zone D - Middle Miocene (1270.3 - 1090.2 metres)
Nine samples which contain _Orbulina_ _universa_ without _Globorotalia_ _miotumida_ _miotumida_ are assigned to this zone.

This zone is subdivided using the evolutionary appearance of _Globorotalia_ _peripheroronda_ and/or a general decline in species diversity, especially among the _Globierinoides_. Unfortunately _Globorotalia_ _peripheroronda_ has not been recognised in Kahawai-1. However, a significant reduction in the number of species occurs between 1130.0 and 1110.0 metres and the D1/D2 boundary is, somewhat tentatively, placed accordingly.

Species usually present throughout Zone D (_Globorotalia_ _conica_, _Globorotalia_ _praescitula_ and _Globorotalia_ _miozea_) are, in Kahawai-1, confined to Zone D2 only.

Zone C - Middle Miocene (1070.1 - 950.0[?] metres)
The first occurrence of _Globorotalia_ _miotumida_ _miotumida_ in sidewall core 128 at 1070.1 metres is used to designate the base of Zone C. The appearance of _Globorotalia_ _scitula_ at 1025.0 metres is consistent with this zonal assignment.

The top of this zone is marked by the extinction of Globorotalia mayeri and its replacement by Globorotalia acostaensis. Unfortunately, as preservation deteriorates towards the casing shoe, distinguishing between these two species becomes increasingly difficult. Hence the zonal determination of sidewall core 132 at 950.0 metres is only tentative.

BIBLIOGRAPHY

Bolli, H.M. & Saunders, J.B., 1982. Globorotalia mayeri and its relationship to Globorotalia siakensis and Globorotalia continuosa; J. Foram. Research 12,(1), 39-50.

Hannah, M.J. (in prep). Micropalaeontological analysis of Seahorse-2, Gippsland Basin, Victoria.

KAHAWAI-1 SUMMARY TABLE-2

INTERPRETATIVE DATA

SIDEWALL CORE NO.	DEPTH (METRES)	MICROFOSSIL YIELD	MICROFOSSIL PRESERVATION	PLANKTON DIVERSITY	ZONE (RATING)	AGE
132	950.0	Very Poor	Very Poor	Low	C (2)	late Middle Miocene
131	999.6	Poor	Poor	Low	C (1)	late Middle Miocene
130	1025.0	Good	Very Poor	Low	C (1)	late Middle Miocene
129	1050.0	Good	Good	Low	C (1)	late Middle Miocene
128	1070.1	Moderate	Poor	Moderate	C (1)	late Middle Miocene
127	1090.2	Good	Poor	Moderate	D1(1)	Middle Miocene
126	1110.0	Good	Poor	Moderate	D1(2)	Middle Miocene
125*	1130.0	Excellent	Excellent	High	D2(2)	Middle Miocene
124*	1150.3	Excellent	Good	Moderate	D2(2)	Middle Miocene
123*	1169.9	Poor	Good	High	D2(1)	Middle Miocene
121*	1210.1	Poor	Good	High	D2(1)	Middle Miocene
120*	1230.4	Good	Moderate	High	D2(1)	Middle Miocene
119*	1250.2	Excellent	Very Good	Moderate	D2(1)	Middle Miocene
118*	1270.3	Good	Poor	Low	D2(1)	Middle Miocene
115*	1324.9	Excellent	Excellent	Moderate	E2(1)	late Early Miocene
84*	1339.9	Excellent	Good	High	F (0)	late Early Miocene
83*	1352.0	Excellent	Good	High	F (0)	late Early Miocene
82*	1357.0	Good	Poor	Moderate	F (1)	late Early Miocene
114*	1361.3	Excellent	Good	Moderate	F (0)	late Early Miocene
81*	1365.0	Excellent	Excellent	High	F (0)	late Early Miocene
79*	1369.0	Excellent	Excellent	Moderate		Non diagnostic
113*	1373.0	Poor	Good	Low	G (1)	Misplaced
77*	1376.2	Excellent	Excellent	Moderate	F (0)	late Early Miocene
76*	1379.0	Excellent	Excellent	Low	G (1)	Early Miocene
112*	1379.2	Excellent	Excellent	High	D1(1)	Misplaced
75*	1382.1	Excellent	Good	Moderate	G (1)	Early Miocene
73*	1386.0	Poor	Very Poor	Low	G (2)	Early Miocene
72*	1387.0	Good	Poor	Moderate	G (1)	Early Miocene
71	1388.1	NFF				Indeterminate
70	1389.0	NFF				Indeterminate
110	1392.0	Very Low	Poor			Rare Agglutinated benthonics only
65*	1394.0	Very Low	Good	Very Low		Indeterminate - contaminants only
63	1396.1	Very Low	Good	Very Low		Indeterminate - contaminants only

*Slide Prepared.

MICROPALEONTOLOGICAL DATA SHEET

BASIN: GIPPSLAND　　ELEVATION: KB: 21m　GL: -81m

WELL NAME: KAHAWAI-1　　TOTAL DEPTH: 2321 metres

AGE		FORAM. ZONULES	HIGHEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	LOWEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
PLEISTOCENE		A_1										
		A_2										
PLIOCENE		A_3										
		A_4										
		B_1										
MIOCENE	LATE	B_2										
		C	950.0	2	999.6	1		1070.1	1			
	MIDDLE	D_1	1090.2	1				1110.0	2			
		D_2	1130.0	2				1270.3	1			
		E_1										
		E_2	1324.9	1				1324.9	1			
	EARLY	F	1339.9	0				1376.2	0			
		G	1379.2	1				1387.0	1			
		H_1										
OLIGOCENE	LATE	H_2										
		I_1										
		I_2										
	EARLY	J_1										
		J_2										
EOCENE		K										
		Pre-K										

COMMENTS:

CONFIDENCE RATING:
- O: SWC or Core - Complete assemblage (very high confidence).
- 1: SWC or Core - Almost complete assemblage (high confidence).
- 2: SWC or Core - Close to zonule change but able to interpret (low confidence).
- 3: Cuttings - Complete assemblage (low confidence).
- 4: Cuttings - Incomplete assemblage, next to uninterpretable or SWC with depth suspicion (very low confidence).

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: M.J. HANNAH　　DATE: 22 OCTOBER 1982

DATA REVISED BY:　　DATE:

PART 2

BASIC DATA

SUMMARY TABLE

RANGE CHART

KAHAWAI-1 SUMMARY TABLE-3

BASIC DATA

SIDEWALL CORE NO.	DEPTH (METRES)	MICROFOSSIL YIELD	MICROFOSSIL PRESERVATION	PLANKTON DIVERSITY
132	950.0	Very Poor	Very Poor	Low
131	999.6	Poor	Poor	Low
130	1025.0	Good	Very Poor	Low
129	1050.0	Good	Good	Low
128	1070.1	Moderate	Poor	Moderate
127	1090.2	Good	Poor	Moderate
126	1110.0	Good	Poor	Moderate
125*	1130.0	Excellent	Excellent	High
124*	1150.3	Excellent	Good	Moderate
123*	1169.9	Poor	Good	High
121*	1210.1	Poor	Good	High
120*	1230.4	Good	Moderate	High
119*	1250.2	Excellent	Very Good	Moderate
118*	1270.3	Good	Poor	Low
115*	1324.9	Excellent	Excellent	Moderate
84*	1339.9	Excellent	Good	High
83*	1352.0	Excellent	Good	High
82*	1357.0	Good	Poor	Moderate
114*	1361.3	Excellent	GOod	Moderate
81*	1365.0	Excellent	Excellent	High
79*	1369.0	Excellent	Excellent	Moderate
113*	1373.0	Poor	Good	Low
77*	1376.2	Excellent	Excellent	Moderate
76*	1379.0	Excellent	Excellent	Low
112*	1379.2	Excellent	Excellent	High
75*	1382.1	Excellent	Good	Moderate
73*	1386.0	Poor	Very Poor	Low
72*	1387.0	Good	Poor	Moderate
71	1388.1	NFF		
70	1389.0	NFF		
110	1392.0	Very Low	Poor	
65*	1394.0	Very Low	Good	Very Low
63	1396.1	Very Low	Good	Very Low

*Slide Prepared.

PE902655

This is an enclosure indicator page.
The enclosure PE902655 is enclosed within the container PE902654 at this location in this document.

The enclosure PE902655 has the following characteristics:

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CONTAINER_BARCODE =	PE902654
NAME =	Gippsland Basin Forams Chart
BASIN =	GIPPSLAND
PERMIT =	VIC/L4
TYPE =	WELL
SUBTYPE =	DIAGRAM
DESCRIPTION =	Gippsland Basin Forams Chart (enclosure from vol. 2 of WCR) for Kahawai-1
REMARKS =	
DATE_CREATED =	
DATE_RECEIVED =	02/05/1983
W_NO =	W776
WELL_NAME =	Kahawi-1
CONTRACTOR =	ESSO
CLIENT_OP_CO =	ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 2

APPENDIX 2

APPENDIX 2

PALYNOLOGICAL ANALYSIS

APPENDIX-2

PALYNOLOGICAL ANALYSIS, KAHAWAI-1,

GIPPSLAND BASIN

by

M.K. Macphail

Esso Australia Ltd.

Palaeontology Report 1982/32

September 17, 1982

0179L

INTERPRETATIVE DATA

INTRODUCTION

Fifty eight (58) sidewall core and two cuttings samples were processed and examined for spore-pollen and dinoflagellates. The recovery of spore-pollen was usually poor to fair, with good yields separated by intervals with low diversity or barren. Preservation was usually poor but most samples contained marker species, enabling confident age-determinations. A feature of this well was the large number of samples containing caved or re-worked spore-pollen and dinoflagellates of post-Eocene or Paleocene/Late Cretaceous age. One sample, at 1508.0 metres, has been mislabelled.

Palynological zones and lithological facies divisions from the base of the Lakes Entrance Formation to the total depth of the well are given below. Table 1 represents a summary of the palynological analyses. The occurrence of the more stratigraphically important species is tabulated in the accompanying range chart.

SUMMARY

UNIT/FACIES	ZONE	DEPTH (Metres)
LAKES ENTRANCE FORMATION	P. tuberculatus	1389.0
"GURNARD FORMATION"	Middle N. asperus	1391.2 - 1393.0
	Lower N. asperus	1394.0 - 1396.1
LATROBE GROUP COARSE CLASTICS	P. asperopolus	1411.0 - 1426.2
	Upper M. diversus	1472.1
	Middle M. diversus	1495.2 - 1528.5
	Lower M. diversus	1572.2
	Upper L. balmei	1577.6 - 1687.8
	Lower L. balmei	1738.2 - 1932.7
	T. longus	1960.3 - 2307.5
		2321 TD

GEOLOGICAL COMMENTS:

1. The Kahawai-1 well contains a continuous sequence of zones from the Late Cretaceous T. longus Zone to the Early Eocene P. asperopolus Zone. Despite the close sidewall core sampling, it has not been possible to demonstrate unequivocably the presence of Lower N. asperus Zone sediments. Upper N. asperus Zone sediments are absent, reflecting a period of erosion or non-deposition during the Late Eocene/Early Oligocene.

2. Samples at and above the log break at 1390.0m, picked as the base of the Lakes Entrance Formation (Hannah 1982), are P. tuberculatus Zone in age. The interval between 1390 and 1400m picked as the Gurnard Formation (Hannah ibid) is Middle- or Middle to Lower N. asperus Zone in age. This contrasts with a Lower N. asperus age for the Formation in the Tuna Field wells.

3. Most of the samples in the Gurnard Formation contained rare P. tuberculatus Zone and Paleocene to Late Cretaceous spore-pollen. Whilst the latter are almost certainly contaminants, the P. tuberculatus Zone species may be due to either contamination or reworking of the Gurnard Formation during the Oligocene. The latter is considered to be the less likely hypothesis for reasons given in the discussion of the palynological zones.

4. The Tuna-Flounder channel sediments are P. asperopolus Zone in age. Not all contained dinoflagellates, i.e. evidence of deposition in a marine environment, e.g. 1426.6m. This sample contained distinctive swollen pollen - considered to be indicative of having been at one time within the oil column, a feature consistent with the log character at this depth.

5. The sidewall core at 1472.1 metres, immediately below the log break at 1468 metres picked as the base of the channel, is brackish water/non-marine and contains an Upper M. diversus Zone spore-pollen assemblage. This sequence of P. asperopolus Zone channel sediments overlying Upper M. diversus Zone sediments differs from those in the Tuna Field where channel sediments of P. asperopolus Zone age overlie Lower M. diversus Zone sediments (Tuna-3) or Upper L. balmei Zone sediments (Tuna-1, Tuna A5). The presence of sediments of Upper M. diversus Zone age between 4820-5098 feet (1469.1-1553.9 metres) above the channel base in the Tuna-2 well is anomalous. This age-determination was made on one poor quality sample (5098 feet) and, based on an assemblage count (see attached Revision sheet for Tuna-2), the sample is reinterpreted as P. asperopolus Zone in age.

6. The occurrence of Upper and Middle M. diversus Zone sediments at Kahawai-1 is consistent with a location at the western edge of the channel in westward dipping sediments, as recorded by seismic stratigraphy. The data indicate channelling in this area occurred during or at end of Upper M. diversus Zone times although earlier episode(s) of channelling in the deeper (eastward) section of the basin remains a possibility. Mean sedimentation rates at Kahawai-1 changed from 22 metres per million years during the M. diversus Zone to 45 metres per million years during infilling of the Tuna-Flounder Channel in P. asperopolus Zone time.

7. Most of the samples within the M. diversus Zone contained frequent dinoflagellates. Since only three species were recorded, these are interpreted to represent transient brackish water conditions.

The sidewall core samples at 1572.2m and 1577.6m contained dinoflagellate assemblages diagnostic of the Apectodinium (Wetzeliella) hyperacantha marine transgression, described by Partridge (1976). The dinoflagellate and Lower M.diversus spore-pollen assemblage in the higher sample is virtually identical to that recovered from the Rivernook Bed of the onshore Princetown Section, Otway Basin. The lower sample contained a diverse Upper L.balmei Zone spore-pollen assemblage. Consequently the carbonaceous siltstone strata between ca 1578-1572 metres is likely to represent the Paleocene/Eocene boundary.

8. Four sidewall cores in the approximately 214 metre thick Lower L.balmei Zone section - between 1791.3 to 1820.0m and at 1932.7m - contained frequent to abundant dinoflagellates. None contained the marker dinoflagellate species for the Eisenackia crassitabulata or the Trithyrodinium evittii marine transgressions recognised by Partridge (ibid).

9. The well bottomed in T. longus Zone sediments as predicted by seismic stratigraphy.

DISCUSSION OF ZONES

Zone boundaries have been established using the criteria of Stover & Evans (1973), Stover & Partridge (1973), Partridge (1976) and subsequent unpublished revisions.

Tricolpites longus Zone: 2307.5 to 1960.3 metres

Samples from this section are dominated by Gambierina rudata and gymnosperm pollen but the majority contained species which first appear in this zone: Tetracolporites verrucosus, Tricolpites waiparensis, Tetradopollis securis, Proteacidites otwayensis and

P. reticuloconcavus. The age of the basal sample is equivocal since it contains abundant Nothofagidites pollen, a characteristic of the T. lilliei Zone. It has been included in the T. longus Zone on the basis of Tetracolporites verrucosus and Tricolpites waiparensis. The first occurrence of the Zone species Tricolpites longus is at 2294.2 metres. The top of the zone is placed at 1960.3 metres, based on the last appearance of abundant Gambierina rudata associated with Proteacidites otwayensis and P. reticuloconcavus.

Lower Lygistepollenites balmei Zone: 1932.7 to 1738.2 metres
The section is characterized by general L. balmei Zone markers such as abundant Lygistepollenites balmei and Polycolpites langstonii in association with Tetracolporites verrucosus, a species which ranges no higher than the Lower L. balmei Zone. Samples at 1791.3, 1820.0 and 1932.7 metres represent marine incursions and contain Deflandrea speciosus, a dinoflagellate restricted to this zone.

Upper Lygistepollenites balmei Zone: 1687.8 to 1577.6 metres
The base of the zone is defined by the first appearance of Verrucosisporites kopukuensis associated with abundant Lygistepollenites balmei. This sample (1687.8 metres) contains Eocene to Miocene spore-pollen as contaminants but the occurrence of a number of specimens of Phyllocladidites verrucosus shows the sample can be no younger than Upper L. balmei Zone in age. As with the Lower L. balmei Zone, the interval is characterized by barren samples and spore-pollen assemblages of low diversity. Cyathidites gigantis, which first appears in this zone occurs in the top three samples. The zone boundary (1577.6 metres) is placed at the last occurrence of abundant Lygistepollenites balmei associated with Cyathidites gigantis and Polycolpites langstonii.

This sample contains rare specimens of Malvacipollis diversus and Apectodinium hypracantha, marker species for the M. diversus Zone, but not Spinizonocolpites prominatus which reaches its greatest abundance in those Lower M. diversus Zone assemblages which also record the A. hyperacantha Zone Marine transgression. This indicates sidewall core 49 lies close to or at the Upper L. balmei/Lower M. diversus Zone boundary.

Lower Malvacipollis diversus Zone: 1572.2 metres
This zone is represented by one sample, occurring below an interval with carbonaceous but barren sandstones. The zone is defined by the simultaneous first occurrence of abundant Malvacipollis diversus and Apectodinium hyperacantha with Proteacidites pachypolus, Spinizonocolpites prominatus, Crassiretitriletes vanraadshoovenii and Polypodiaceosporites varus and the dinoflagellate Cordosphaeridium bipolare.

Middle Malvacipollis diversus Zone 1495.2 to 1528.5 metres
The base of the zone is placed at the first occurrence of Proteacidites ornatus. This sample lacks Malvacipollis diversus and also contains Cyathidites gigantis, typically a good marker species for the Lower M. diversus Zone. The cuttings sample from 1505-1510m contains frequent Malvacipollis diversus and Polycolpites esobalteus which first appears in the Middle M. diversus Zone. The age-determination for the interval is confirmed by the simultaneous first appearances of Proteacidites biornatus, P. delicatus, P. kopiensis, P. latrobensis, P. leightonii, P. plemmelus and P. tuberculiformis in association with P. ornatus at 1498.7 metres. The majority of these species occur in the sample picked as the top of the zone (1495.2 metres) along with Banksieacidites elongatus and Polycolpites esobalteus, as well as Integricorpus antipodus which ranges no higher than the Middle M. diversus Zone.

Upper Malvacipollis diversus Zone: 1472.1 metres

The zone is represented by one sample only. The occurrence of Proteacidites pachypolus with Myrtaceoipollenites australis and Bysmapollis emaciatus confirm the age determination. The sample lacks dinoflagellates and is dominated by Nothofagidites spp. and Proteacidites spp. typical of the M. diversus Zone. It is unusual in that species which first appear in the Lower and Middle M. diversus Zone are first recorded here, e.g. Anacolosidites acutullus, Intratriporopollenites notabilis and Triporopollenites ambiguus. As for samples in the Middle M. diversus Zone section, the sample contains reworked L. balmei Zone spore-pollen.

Proteacidites asperopolus Zone: 1411.0 to 1426.6 metres

Samples within this interval are dominated by Proteacidites spp., with common to abundant P. pachypolus and less than 5% Nothofagidites spp. except where caving has occurred (1411.0 metres). The base of the zone is placed at 1422.6 metres, the first appearance of the nominate species Proteacidites asperopolus, P. recavus and Liliacidites bainii. In addition, to P. asperopolus, the sample at 1424.6 metres contains P. rugulatus and Beaupreadites trigonalis, species which first appear in this zone, and Santalumidites cainozoicus and Diporites delicatus, which achieve their maximum abundance in the P. asperopolus Zone. The sample picked as the top of the zone (1411.0 metres) contains L. balmei Zone pollen indicators, relatively common Nothofagidites spp. and caved P. tuberculatus Zone spore-pollen and dinoflagellates. It is assigned to the P. asperopolus Zone on the basis of Myrtaceoipollenites australis, Santalumidites cainozoicus, Proteacidites pachypolus (common) and a general absence of marker species for the Lower N. asperus Zone.

Nothofagidites asperus Zone: 1396.1 - 1391.2 metres

The interval corresponding to the Gurnard Formation (Hannah 1982) contained spore-pollen and dinoflagellate assemblages dominated by Nothofagidites spp (including N. falcatus) and Operculodinium centrocarpum respectively. Most samples contained 1-3 specimens of P. tuberculatus Zone spore-pollen, Foveotriletes crater, F. lacunosus, Cyathidites subtilis, as well as a diversity of Paleocene and Late Cretaceous pollen, e.g. Lygistepollenites balmei, Gambierina rudata, Australopollis obscurus, Tetracolporites verrucosus, Triporopollenites sectilis, Tricolporites lilliei, T. pachyexinus, Tricolpites waiparensis and Nothofagidites endurus. The sample at 1389.9 metres immediately below the base of the Lakes Entrance Formation contained a good T. longus Zone assemblage in which Malvacipollis subtilis and Matonosporites ornamentalis are the only identified post-Cretaceous elements. Cuttings from this interval (1385-1390 metres) contained a very sparse spore-pollen and dinoflagellate assemblage, lacking Paleocene and Late Cretaceous species. All occurrences of these taxa in the N. asperus Zone sediments are therefore considered to be contaminants.

The presence of P. tuberculatus Zone spore-pollen may be accounted for in one or more of 3 ways: (1) contamination (2) extension into the Eocene of the range of the Foveotriletes and Cyathidites species and (3) reworking of the interval from 1396.1 to 1389.9 metres during P. tuberculatus Zone times. The first is considered the most likely due to (i) extensive caving of the section immediately overl ng the Gurnard Formation (ii) the absence of the major indicator species for the P. tuberculatus Zone, Cyatheacidites annulatus, and (iii) the presence of an N. asperus Zone assemblage within these sediments similar to that found in the Gurnard Formation in the Tuna wells.

The interval has been tentatively subdivided into Lower N. asperus Zone and Middle N. asperus Zone sections on the basis of species which first appear in the Middle N. asperus Zone. The possibility remains that the entire interval from 1936.1 to 1389.9 metres is either wholly Lower N. asperus or Middle N. asperus Zone in age. The indicator species of the latter zone, Triorites magnificus, is absent.

Lower N. asperus Zone: 1396.1 to 1392.0 metres
The base of the zone is placed at the marked increase in Nothofagidites spp. abundance from less than 5% at 1424.6 metres to greater than 30% at 1396.1 metres. This sample contained Tricolpites simatus, a general marker species for the Middle N. asperus Zone but which first appears in the Lower N. asperus Zone. Samples at 1395.0 and 1394.0 metres contain Nothofagidites falcatus and Proteacidites scitus which ranges no higher than the Middle N. asperus Zone.

Middle N. asperus Zone 1391.2 to 1393.0 metres
The base of the zone is picked at 1393.0 metres on the occurrence of Cranwellia striatus, a rare species which is apparently restricted to the Middle N. asperus Zone, and the simultaneous presence of Proteacidites species typical of or ranging no higher than this zone: Proteacidites scitus, P. rugulatus and P. pachypolus. Aglaoreidia qualumis and Stereisporites (Tripunctisporis) punctatus are present at 1392.0 metres.

P. tuberculatus Zone: 1389.0 to 1369.0 metres
The regular occurrence of Cyatheacidites annulatus in these samples confirms a P. tuberculatus Zone age for these sediments.

TABLE 1

SUMMARY OF PALYNOLOGICAL ANALYSIS, KAHAWAI-1, GIPPSLAND BASIN

INTERPRETATIVE DATA

SAMPLE NO.	DEPTH (Metres)	YIELD	DIVERSITY SPORE-POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
79	1369.0	Good	Moderate	Mdst., calc.	P. tuberculatus	Miocene	0	Cyatheacidites annulatus
77	1376.2	Good	High	Slst., calc.	P. tuberculatus	Miocene	0	C. annulatus, Gyrostemonaceae
73	1386.0	Fair	High	Slst., glau, calc.	P. tuberculatus	Miocene	0	C. annulatus, reworked Late Eocene to Late Cretaceous spore-pollen
70	1389.0	Good	Low	Sst., glau, calc.	P. tuberculatus	Post-Eocene	0	C. annulatus
69	1389.9	Good	High	Slst., calc.	Indeterminate	-	-	C. annulatus
68	1391.2	Good	Moderate	Slst.	Middle N. asperus	Late Eocene	2	
110	1392.0	Good	High	Sst., glau.	Middle N. asperus	Late Eocene	2	mixed P. tuberculatus/Middle N. asperus assemblage
66	1393.0	Good	High	Sst., glau	Middle N. asperus	Late Eocene	2	Cranwellia striatus. Reworked Paleocene s-p.
65	1394.0	Low	Moderate	Sst., glau.	Lower N. asperus	Middle Eocene	2	
64	1395.0	Good	High	Sst., slightly calc., glau.	Lower N. asperus	Middle Eocene	2	Proteacidites scitus, P. grandis Caved P.tuberculatus s-p.
63	1396.1	Low	Moderate	Sst., slightly calc., glau.	Lower N. asperus	Middle Eocene	2	Caved P. tuberculatus s-p.
62	1405.0	Nil	-	Sst.	-	-	-	
61	1408.0	Nil	-	Sst.	-	-	-	
60	1411.0	Low	Moderate	Sst.	P. asperopolus	Early Eocene	2	P. pachypolus, S. cainozoicus, M. tenuis caved P. tuberculatus dinos and s-p.
59	1413.6	Nil	-	Sst.	-	-	-	
109	1424.6	Low	High	Sltst., carb.	P. asperopolus	Early Eocene	0	Less than 5% Nothofagidites pollen
58	1426.6	High	High	Slst., carb.	P. asperopolus	Early Eocene	0	P. asperopolus, P. pachypolus (common)
56	1468.8	Very low	Poor	Sst., carb.	Indeterminate	-	-	

SAMPLE NO.	DEPTH (Metres)	YIELD	DIVERSITY SPORE-POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
55	1472.1	Low	High	Slst., carb.	Upper M. diversus	Early Eocene	2	
54	1486.9	Nil	-	Sst., carb.	-	-	-	
107	1495.2	High	High	Slst., carb.	Middle M. diversus	Early Eocene	1	Banksieacidites elongatus
53	1498.7	High	High	Slst.	Middle M. diversus	Early Eocene	1	P. tuberculiformis
106	1508.0	High	High	Slst., carb.	Upper L. balmei	Paleocene	1	Mislabelled sample
ctg	1505-1510	High	Moderate	-	Middle M. diversus	Early Eocene	2	Polycolpites esobalteus
52	1520.3	Nil	-	Sst., carb.	-	-	2	P. ornatus, C. gigantis
105	1531.0	Very low	Poor	Sst., carb.	Indeterminate	-	-	T. waiparensis
50	1572.2	High	High	Slst., carb.	Lower M. diversus	Early Eocene	0	A. hyperacantha transgression
49	1577.6	High	High	Slst., carb.	Upper L. balmei	Eocene/ Paleocene boundary	0	A. hyperacantha transgression
48	1585.3	Nil	-	Sst., carb.	-	-	-	
47	1596.1	High	High	Slst., carb.	Upper L. balmei	Paleocene	0	V. kopukuensis, C. gigantis
46	1604.2	High	Moderate	Coal	Upper L. balmei	Paleocene	1	C. gigantis
45	1611.2	High	Moderate	Slst. carb.	Upper L. balmei	Paleocene	0	V. kopukuensis
44	1626.4	Very Low	Poor	Sst., carb.	Indeterminate	-	-	
43	1639.8	Fair	Poor	Mdst; carb.	Upper L. balmei	Paleocene	0	V. kopukuensis
41	1671.8	Fair	Poor	Slst., carb.	Upper L. balmei	Paleocene	0	V. kopukuensis
40	1687.8	High	High	Sst., carb.	Upper L. balmei	Paleocene	1	V. kopukuensis Caved P. tuberculatus s-p
39	1701.1	Very low	Poor	Slst.	Indeterminate	-	-	
103	1719.5	Low	Moderate	Sst.	L. balmei	Paleocene		L. balmei, P. langstonii
38	1738.2	Very high	High	Slst., carb.	Lower L. balmei	Paleocene	0	T. verrucosus, P. langstonii
37	1749.2	Very low	Poor	Sst.	Lower L. balmei	Paleocene	1	Parvisaccites catastus

BASIN: GIPPSLAND ELEVATION: KB: 21.0 GL: -81.0

WELL NAME: KAHAWAI-1 REVISED TOTAL DEPTH: 2321 metres

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	LOWEST DATA Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	*T. pleistocenicus*										
	M. lipsis										
	C. bifurcatus										
	T. bellus										
	P. tuberculatus	1369.0	0				1389.0	0			
PALEOGENE	Upper *N. asperus*										
	Mid *N. asperus*	1391.2	2				1393.0	2			
	Lower *N. asperus*	1394.0	2				1396.1	2			
	P. asperopolus	1400.7	1				1426.6	0			
	Upper *M. diversus*	1472.1	2				1472.1	2			
	Mid *M. diversus*	1495.2	1				1528.5	2			
	Lower *M. diversus*	1554.6	1				1572.2	0			
	Upper *L. balmei*	1577.6	0				1687.8	1			
	Lower *L. balmei*	1738.2	0				1932.7	2	1895.6	1	
LATE CRETACEOUS	Upper *T. longus*	1960.3	1				2005.1				
	Lower *T. longus*	2065.6	2	2271.4	1		2307.5	2	2294.2	1	
	T. lilliei										
	N. senectus										
	T. apoxyexinus										
	P. mawsonii										
	A. distocarinatus										
EARLY CRET.	*P. pannosus*										
	C. paradoxa										
	C. striatus										
	C. hughesi										
	F. wonthaggiensis										
	C. australiensis										

COMMENTS: Depths in metres.

CONFIDENCE RATING:
- O: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
- 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
- 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
- 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton, or both.
- 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: M.K. Macphail DATE: 17 September 1985

PALYNOLOGY DATA SHEET

BASIN: GIPPSLAND ELEVATION: KB: 21.0 GL: -81.0

WELL NAME: KAHAWAI-1 TOTAL DEPTH: 2321 metres

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	*T. pleistocenicus*										
	M. lipsis										
	C. bifurcatus										
	T. bellus										
	P. tuberculatus	1369.0	0				1389.0	0			
PALEOGENE	Upper *N. asperus*										
	Mid *N. asperus*	1391.2	2				1393.0	2			
	Lower *N. asperus*	1394.0	2				1396.1	2			
	P. asperopolus	1411.0	2	1424.6	0		1426.6	0			
	Upper *M. diversus*	1472.1	2				1472.1	2			
	Mid *M. diversus*	1495.2	1				1528.5	2			
	Lower *M. diversus*	1572.2	0				1572.2	0			
	Upper *L. balmei*	1577.6	0				1687.8	1			
	Lower *L. balmei*	1738.2	0				1932.7	2	1895.6	1	
LATE CRETACEOUS	*T. longus*	1960.3	1				2307.5	2	2294.2	0	
	T. lilliei										
	N. senectus										
	U. *T. pachyexinus*										
	L. *T. pachyexinus*										
	C. triplex										
	A. distocarinatus										
EARLY CRET.	*C. paradoxus*										
	C. striatus										
	F. asymmetricus										
	F. wonthaggiensis										
	C. australiensis										
	PRE-CRETACEOUS										

COMMENTS:

CONFIDENCE RATING:

0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton, or both.
4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: M.K. Macphail DATE: 17 September

DATA REVISED BY: DATE:

SAMPLE NO.	DEPTH (Metres)	YIELD	DIVERSITY SPORE-POLLEN	LITHOLOGY	ZONE	AGE	CONFIDENCE RATING	COMMENTS
35	1775.2	Fair	Poor	Sst., carb.	Lower L. balmei	Paleocene	1	Australopollis obscurus
34	1791.3	High	Poor	Slst., carb.	Lower L. balmei	Paleocene	1	T. verrucosus
33	1808.4	Fair	Poor	Slst., carb.	Lower L. balmei	Paleocene	2	
32	1820.0	High	Moderate	Slst., carb.	Lower L. balmei	Paleocene	1	T. verrucosus. Marine
31	1833.1	Very low	Poor	Slst.	L. balmei	Paleocene		Marine
27	1895.6	Fair	Moderate	Clyst., carb.	Lower L. balmei	Paleocene	1	T. verrucosus, A. obscurus
25	1918.3	Very Low	Poor	Slst.	L. balmei	Paleocene	-	
24	1932.7	High	Moderate	Slst., carb.	Lower L. balmei	Paleocene	2	Abundant T. verrucosus. Marine
22	1960.3	Low	Moderate	Slst., carb.	T. longus	Late Cretaceous	1	P. otwayensis, P. reticuloconcavus, T. securus, G. rudata (common)
21	2966.9	Low	Moderate	Sst., carb.	T. longus	Late Cretaceous	1	P. otwayensis, P. reticuloconcavus
20	1997.6	High	High	Sst., carb.	T. longus	Late Cretaceous	0	T. longus, Quadraplanus brossus
19	2005.1	High	High	Sst., carb.	T. longus	Late Cretaceous	0	T. longus, Q. brossus
17	2041.0	Very low	Poor	Sst., carb.	Indeterminate	-	-	L. amplus, G. rudata
15	2065.6	Fair	Poor	Sst., carb.	T. longus	Late Cretaceous	2	T. verrucosus (common), T. lilliei
8	2191.6	Fair	Moderate	Slst., carb.	T. longus	Late Cretaceous	0	Jaxtacolpus pieratus, T. waiparensis, T. verrucosus, L. balmei
4	2271.4	Fair	Moderate	Sst., carb.	T. longus	Late Cretaceous	0	T. longus
2	2294.2	Low	Moderate	Sst., carb.	T. longus	Late Cretaceous	0	T. longus
1	2307.5	High	High	Slst.	T. longus	Late Cretaceous	2	T. verrucosus, P. otwayensis, P. reticuloconcavus, T. waiparensis

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

EXPLORATION DEPARTMENT PALYNOLOGY LABORATORY
PROVISIONAL REPORT

REPORTED TO:	D.A. Schwebel	
PHONED TO:		
SEEN BY:	M.K. Macphail	

WELL: TUNA-A2

REPORT NO: 1

DATE: 20 SEPTEMBER 1982

SAMPLE No.	DEPTH (in feet)	RECEIVED	AGE	ZONE	DIVISION
	5098		EARLY-MIDDLE EOCENE	P. asperopolus	

COMMENTS: This sample, at the base of the Tuna-Flounder channel sediments in the Tuna-A2 well, was originally dated as Upper M. diversus Zone in age. Although the sample contains a number of spore-pollen species which first appear in the Upper M. diversus Zone, none are restricted to this zone. It is now considered to be P. asperopolus Zone in age (confidence rating 2), based on relatively frequent Proteacidites pachypolus, P. asperopolus and Myrtaceidites tenuis.

BASIC DATA

Table - 2: Palynological Data

Range Chart - Dinoflagellates

Range Chart - Spore Pollen

TABLE 2

SUMMARY OF PALYNOLOGICAL ANALYSIS, KAHAWAI-1, GIPPSLAND BASIN

BASIC DATA

SAMPLE NO.	DEPTH (Metres)	YIELD	DIVERSITY SPORE-POLLEN	LITHOLOGY
79	1369.0	Good	Moderate	Mdst., calc.
77	1376.2	Good	High	Slst., calc.
73	1386.0	Fair	High	Slst., glau, calc.
70	1389.0	Good	Low	Sst., glau, calc.
69	1389.9	Good	High	Slst., calc.
68	1391.2	Good	Moderate	Slst.
110	1392.0	Good	High	Sst., glau.
66	1393.0	Good	High	Sst., glau
65	1394.0	Low	Moderate	Sst., glau.
64	1395.0	Good	High	Sst., slightly calc., glau.
63	1396.1	Low	Moderate	Sst., slightly calc., glau.
62	1405.0	Nil	-	Sst.
61	1408.0	Nil	-	Sst.
60	1411.0	Low	Moderate	Sst.
59	1413.6	Nil	-	Sst.
109	1424.6	Low	High	Sltst., carb.
58	1426.6	High	High	Slst., carb.
56	1468.8	Very low	Poor	Sst., carb.
55	1472.1	Low	High	Slst., carb.
54	1486.9	Nil	-	Sst., carb.
107	1495.2	High	High	Slst., carb.
53	1498.7	High	High	Slst.
106	1508.0	High	High	Slst., carb.
ctg	1505-1510	High	Moderate	-
52	1520.3	Nil	-	Sst., carb.
105	1531.0	Very low	Poor	Sst., carb.
50	1572.2	High	High	Slst., carb.
49	1577.6	High	High	Slst., carb.

SAMPLE NO.	DEPTH (Metres)	YIELD	DIVERSITY SPORE-POLLEN	LITHOLOGY
48	1585.3	Nil	-	Sst., carb.
47	1596.1	High	High	Slst., carb.
46	1604.2	High	Moderate	Coal
45	1611.2	High	Moderate	Slst. carb.
44	1626.4	Very Low	Poor	Sst., carb.
43	1639.8	Fair	Poor	Mdst; carb.
41	1671.8	Fair	Poor	Slst., carb.
40	1687.8	High	High	Sst., carb.
39	1701.1	Very low	Poor	Slst.
103	1719.5	Low	Moderate	Sst.
38	1738.2	Very high	High	Slst., carb.
37	1749.2	Very low	Poor	Sst.
35	1775.2	Fair	Poor	Sst., carb.
34	1791.3	High	Poor	Slst., carb.
33	1808.4	Fair	Poor	Slst., carb.
32	1820.0	High	Moderate	Slst., carb.
31	1833.1	Very low	Poor	Slst.
27	1895.6	Fair	Moderate	Clyst., carb.
25	1918.3	Very Low	Poor	Slst.
24	1932.7	High	Moderate	Slst., carb.
22	1960.3	Low	Moderate	Slst., carb.
21	2966.9	Low	Moderate	Sst., carb.
20	1997.6	High	High	Sst., carb.
19	2005.1	High	High	Sst., carb.
17	2041.0	Very low	Poor	Sst., carb.
15	2065.6	Fair	Poor	Sst., carb.
8	2191.6	Fair	Moderate	Slst., carb.
4	2271.4	Fair	Moderate	Sst., carb.
2	2294.2	Low	Moderate	Sst., carb.
1	2307.5	High	High	Slst.

Well Name KAHAWAI-1 Basin GIPPSLAND

SAMPLE TYPE *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	T	S
PALYNOMORPHS / DEPTHS (Metres)	1369.01	1376.2	1386.0	1389.0	1389.9	1391.2	1392.0	1393.0	1394.0	1395.0	1396.1	1411.0	1424.6	1426.6	1468.8	1472.1	1495.2	1498.7	1505-10	1528.5
Protoellipso. simplex			rare									rare								
Operculodinium centrocarpum			rare	common		common	rare	rare		rare		frequent								
Spiniferites ramosus			rare			rare						rare								
Tectatodinium marlum																				
Schematophora speciosus							rare													
Spinidinium macmurdoense						rare														
Baltisphaeridium nudum						rare														
Cordosphaeridium inodes																				
Hystrichokolpoma rigaude							rare										rare			
Horologinella spinata							rare													
Cassiculosp. imperfecta								rare												
Phthanoperidium comatum								rare		rare										
Deflandrea phosphoritica																				
Nematosphaeropsis rizoma												rare								
Lingulodinium solarum								rare												
Cordosphaeridium bipolare																				
Apectodinium hyperacantha																				
Apectodinium homomorpha																rare		frequent	rare	rare
Thalassiphora flammea																				
Glaphyrocysta retiitexta																				
Senegalium dilwynense																				
Deflandrea speciosus																				
Unidentified species	frequent	abundant/dominant	common	common	common	common	common	rare	frequent	frequent	rare	frequent				rare	common	frequent	rare	frequent

SAMPLE TYPE *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
PALYNOMORPHS / DEPTHS (Metres)	1531.0	1572.2	1577.6	1596.1	1604.2	1611.2	1626.4	1639.8	1671.8	1687.8	1701.1	1719.5	1738.2	1749.2	1775.2	1791.3	1808.4	1820.0	1853.1
Protoellipso. simplex																			
Operculodinium centrocarpum																			
Spiniferites ramosus																			
Tectatodinium marlum																			
Schematophora speciosus																			
Spinidinium macmurdoense																			
Baltisphaeridium nudum																			
Cordosphaeridium inodes																			
Hystrichokolpoma rigaude																			
Horologinella spinata																			
Cassiculosp. imperfecta																			
Phthanoperidium comatum																			
Deflandrea phosphoritica																			
Nematosphaeropsis rizoma																			
Lingulodinium solarum																			
Cordosphaeridium bipolare	common																		
Apectodinium hyperacantha	abundant/dominant	rare																	
Apectodinium homomorpha		rare		rare			frequent									frequent			
Thalassiphora flammea	rare																	common	
Glaphyrocysta retiitexta																rare	frequent	frequent	
Senegalium dilwynense																rare		rare	
Deflandrea speciosus																rare		rare	
Unidentified species		abundant/dominant	common	rare			frequent	rare				rare		rare		frequent	common	abundant/dominant	

* C=core: S=sidewall core: T=cutting

MISC.PALY.DIST.CHART DWG.1107/OP/227

/ = rare   X = frequent   ▄ = common   █ = abundant/dominant

Well Name KAHAWAI-1 Basin GIPPSLAND Sheet No 2 of 2

SAMPLE TYPE *	S	S	S
DEPTHS Metres / PALYNOMORPHS	1895.6	1918.3	1932.7
Deflandrea speciosus			X
Operculodinium centrocarpum			/

* C=core: S=sidewall core: T=cutting

MISC.PALY.DIST.CHART DWG.1107/OP/227

Well Name KAHAWAI-1 Basin GIPPSLAND Sheet No. 1 of 6

SAMPLE TYPE *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	T	S	S	S	S	S	S	S	S	S	S
PALYNOMORPHS / DEPTHS	1369.01	1376.2	1386.0	1389.0	1389.9	1391.2	1392.0	1393.0	1394.0	1395.0	1396.1	1411.0	1424.6	1426.6	1472.1	1495.2	1498.7	1505.10	1528.5	1531.0	1572.2	1577.6	1596.1	1604.2	1611.2	1626.4	1639.8	1671.8
A. qualumis							/																					
A. acutullus													/	/	/						/							
A. luteoides																												
A. oculatus																												
A. sectus																												
A. triplaxis																												
A. obscurus			R		R			R				R			R							/			X		/	/
B. disconformis																												
B. arcuatus		/					/						/		/	/			/		/							
B. elongatus																/						/	/	/				
B. mutabilis			R		R										R		R					/	/					
B. otwayensis															R		R				R		/	/			/	
B. elegansiformis																												
B. trigonalis													/															
B. verrucosus									/																			
B. bombaxoides																												
B. emaciatus													/	/	/		/											
C. bullatus																												
C. heskermensis																												
C. horrendus																												
C. meleosus																												
C. apiculatus																												
C. leptos							/	/																				
C. striatus								/																				
C. vanraadshoovenii																			/		/							
C. orthoteichus/major		/					/	/		/	/	/	/		common	/	X				X		/					
C. annulatus	/	/	/	/																								
C. gigantis																			/			X	/	/				
C. splendens			/					/											/		/				/			/
D. australiensis							/					/											/					
D. granulatus	/		/		X						/	/			/		common				/		/					
D. tuberculatus		/								/						/	/				/	X	/					
D. delicatus														/														
D. semilunatus																												
E. notensis														/									/			/		
E. crassiexinus								/																				
F. balteus											/																	
F. crater			/								/																	
F. lucunosus	/		/				/																					
F. palaequetrus							/			/																		
G. edwardsii		R			R									R														
G. rudata	R		R		R		R	R											R				/		/		/	/
G. divaricatus										/						/												
G. gestus																												
G. catathus																												
G. cranwellae								/																				
G. wahooensis					R																							
G. bassensis																												
G. nebulosus																												
H. harrisii		common	common	/	/		X	X	/	X	abundant	/	X	abundant	X	common	X	abundant	X	/	common	/	/	/	/	/		/
H. astrus													/															
H. elliottii					/			/								/							/					/
I. anguloclavatus														/		/	/						/					
I. antipodus																/							/					
I. notabilis													/	/	/						/							
I. gremius	/	/	/				/	/		/							/											
I. irregularis		X	/	/			/	/	/								/				/		/					
J. peiratus																							/					
K. waterbolkii		/	X							/	/																	
L. amplus					R																							
L. crassus		/	/		/			/									/	/	/		/	/	/		/		/	
L. ohaiensis								R																				/
L. bainii														X														
L. lanceolatus													/	/			/	/										
L. balmei			R		R			R				R			R						R	common	X	/	X		X	X
L. florinii	/	common		/			/	/	X			/				/	X	/	/	/		X	/		/			/
M. diversus													/			/	/	X			abundant	/						
M. duratus																												
M. grandis																												
M. perimagnus																												

*C= core; S= sidewall core; T= cuttings.

R = conta inants or reworked specimens
/ = rare
X = frequent
common (half-shaded box) = common
abundant (fully shaded box) = abundant/dominant

Well Name KAHAWAI-1 Basin GIPPSLAND Sheet No 2 of 6

SAMPLE TYPE * / DEPTHS / PALYNOMORPHS	1369.01	1376.2	1386.0	1389.0	1389.9	1391.2	1392.0	1393.0	1394.0	1395.0	1396.1	1411.0	1424.6	1426.6	1472.1	1495.2	1498.7	1505-10	1528.5	1531.0	1572.2	1577.6	1596.1	1604.2	1611.2	1626.4	1639.8	1671.8
SAMPLE TYPE *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	T	S	S	S	S	S	S	S	S	S	S
M. subtilis					/	/	/	/	/	/	/			/	X	■	/	X		/	/	/	X	/				
M. ornamentalis	/	/	/		/		/	/		/				/									/					
M. hypolaenoides																/												
M. homeopunctatus													/															
M. parvus/mesonesus	/	/	/		/	X	/			/		/	/		/		■				/	/	/					
M. tenuis												/																
M. verrucosus			/				/	/																				
M. australis															/	/												
N. asperus	/			/		/	/																					
N. asperoides																												/
N. brachyspinulosus		/				/	/	/	/	/	/		/				/						/					
N. deminutus		/	/	/		X	X	X	/	/	/	/																
N. emarcidus/heterus	■	X	X	/			■	■	X	■	X	/	/	/	X	X	/	/	/			/	/	/	/			/
N. endurus			R		R	R		R					R										/		/		/	
N. falcatus		/	/	/		/	X	X	/	/		/																
N. flemingii						/	/	/	/	/	/		/	/	X	/	X		/		/	/	X				/	/
N. goniatus							/			/						/												
N. senectus																												
N. vansteenisii				/			/					/																
O. sentosa																												
P. ochesis																												
P. catastus							/	/								/	/						/					
P. demarcatus						/	/	/		/	/		/		/	/	X	X		/	/	/	/		/		/	
P. magnus																												
P. polyoratus				/					/	/			/	/	/	/	■		/	/		/	X					/
P. vesicus												/																
P. densus		/																	X			/		/			/	
P. velosus										/		/					/											
P. morganii/jubatus																												
P. mawsonii	X	/	/		X	/	/	X	/	X	/	/	/	/		/	/	/	/	/	/	/	/	X	/	/	/	/
P. reticulosaccatus																												
P. verrucosus																												
P. crescentis																												
P. esobalteus			/										/	/	X	/	/	/			/							
P. langstonii															/		/	/				/	/	/	/		/	
P. reticulatus																												
P. simplex																												
P. varus								/													/							
P. adenanthoides (Prot.)							/									/				/		/						
P. alveolatus																												
P. amolosexinus																							/					
P. angulatus																												
P. annularis		/				/	/			/	/				X	X	/	/	/	/	/	/	X	/				
P. asperopolus													/	/														
P. biornatus													/				/											
P. clarus																												
P. cleinei					R																							
P. confragosus																												
P. crassus					R										/	/												
P. delicatus											/																	
P. formosus												/			/													
P. grandis										/		/		X	X	X	X	/	X	/								
P. grevillaensis								/																				
P. incurvatus								/									/		/			/						
P. intricatus																												
P. kopiensis															/	/	/				/			/				
P. lapis														/					/		/	/						
P. latrobensis													/		/		/											
P. leightonii														/	/	/	/											
P. obesolabrus																												
P. obscurus														/		X	/											
P. ornatus														/	/	/	/		/									
P. otwayensis																												
P. pachypolus							/	/		/		/	/	■	/						/							
P. palisadus			R																									
P. parvus																												
P. plemmelus																	/											
P. prodigus														/				/							■		/	
P. pseudomoides																	/	/					/					
P. recavus														/														

* C=core: S=sidewall core: T=cutting

Well Name KAHAWAI-1 Basin GIPPSLAND Sheet No. 3 of 6

SAMPLE TYPE *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	T	S	S	S	S	S	S	S	S	S	S
PALYNOMORPHS / DEPTHS	1369.01	1376.2	1386.0	1389.0	1389.9	1391.2	1392.0	1393.0	1394.0	1395.0	1396.1	1411.0	1424.6	1426.6	1472.1	1495.2	1498.7	1505-10	1528.5	1531.0	1572.2	1577.6	1596.1	1604.2	1611.2	1626.4	1639.8	1671.8
P. rectomarginis			/																									
P. reflexus																												
P. reticulatus							/	/																				
P. reticuloconcavus																												
P. reticuloscabratus											/												/					
P. rugulatus								/					/															
P. scitus				/				/		/																		
P. stipplatus																												
P. tenuiexinus			/					/						/		/							/					
P. truncatus																												
P. tuberculatus																												
P. tuberculiformis															/		/											
P. tuberculotumulatus																												
P. xestoformis (Prot.)																												
Q. brossus																												
R. boxatus																												
R. stellatus																												
R. mallatus	/	/	/			/		/		/							/			/	/	/	/					
R. trophus																												
S. cainozoicus												/	/	/														
S. rotundus		/								/																		
S. digitatoides																												
S. marlinensis																	/											
S. rarus																												
S. meridianus							/		/	/			/	X	X	X	X	/				/	X				/	
S. prominatus																					X							
S. uvatus																												
S. punctatus			/			/	/	/		/				/							/	/	/					/
S. regium					R																							
T. multistrixus (CP4)																			/			/	/	/				
T. textus								R		R														/				
T. verrucosus			R		R			R																				
T. securus																												
T. confessus (C3)																												
T. gillii					R			R																			/	
T. incisus															/													
T. longus					R																							
T. phillipsii			/				/	/					/		/		/				/							
T. renmarkensis																												
T. sabulosus																												
T. simatus											/																	
T. thomasii																												
T. waiparaensis					R														R					/				
T. adelaidensis (CP3)										/		/	/		/	/	/						/			/		
T. angurium										/				/	/	X												
T. delicatus																												
T. geraniodes																												
T. leuros																/												
T. lilliei					R																							
T. marginatus																												
T. moultonii													/		/							/						
T. paenestriatus			/			/					/				X	/	/											
T. retequetrus																												
T. scabratus							/	/					/															
T. sphaerica																												
T. magnificus (P3)																												
T. spinosus																												
T. ambiguus															/													
T. chnosus																												
T. helosus															/	/	/				/							
T. scabratus										/	/																	
T. sectilis					R			R														R						
V. attinatus																												
V. cristatus																												
V. kopukuensis						/		/		/	/						/				/	/	/		/		/	/

*C = core; S = sidewall core; T = cuttings.

Well Name KAHAWAI-1 Basin GIPPSLAND Sheet No. 4 of 6

PALYNOMORPHS \ DEPTHS	1687.8	1719.5	1738.2	1749.2	1775.2	1791.3	1808.4	1820.0	1833.1	1895.6	1918.3	1952.7	1960.3	1966.9	1997.6	2005.1	2065.6	2096.1	2191.6	2271.4	2294.2	2307.5
SAMPLE TYPE *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
A. qualumis																						
A. acutullus																						
A. luteoides																						
A. oculatus																						
A. sectus																						
A. triplaxis																						
A. obscurus	/		/	/	/	X	/	/		/				/		/						/
B. disconformis																						
B. arcuatus																						
B. elongatus																						
B. mutabilis	/		/	/									/	/								
B. otwayensis	/		/		/	/		/		/		/			/							
B. elegansiformis																						
B. trigonalis			/																			
B. verrucosus																						
B. bombaxoides																						
B. emaciatus																						
C. bullatus																						
C. heskermensis																	/				/	
C. horrendus																/			/			
C. meleosus																						
C. apiculatus																						
C. leptos																						
C. striatus																						
C. vanraadshoovenii																						
C. orthoteichus/major	/											R										
C. annulatus	R																					
C. gigantis																						
C. splendens	/	/	/			/		/		/	/		/		X				/			
D. australiensis																						
D. granulatus	/		X				/	/		/												
D. tuberculatus	/		abundant			/						/										
D. delicatus																						
D. semilunatus																						
E. notensis																						
E. crassiexinus																						
F. balteus	/																					
F. crater																						
F. lucunosus																						
F. palaequetrus																						
G. edwardsii			/			/									/					/		
G. rudata	/		X		/	/	/		/	X	X	/	common	common	abundant	abundant	/	X	/	/	/	/
G. divaricatus																						
G. gestus																						
G. catathus																						
G. cranwellae			/		/														/			
G. wahooensis																/						
G. bassensis																						
G. nebulosus																						
H. harrisii	/		/							/												
H. astrus																						
H. elliottii			/		/						/										/	X
I. anguloclavatus	/																					
I. antipodus																						
I. notabilis																						
I. gremius																						
I. irregularis	/							/					/						/			
J. peiratus			/					/														
K. waterbolkii																						
L. amplus			/				/							/	X	X			/	/	/	/
L. crassus	/	/	/			/		/			/				/	/				/		
L. ohaiensis	/						/							/					/	/		
L. bainii																						
L. lanceolatus																						
L. balmei	common	X	common	/	X	common	X	X	/	/	/	/	/	/	/	/			/			
L. florinii				/		/	/	/		/			/	/	/	/			/			X
M. diversus																						
M. duratus																						
M. grandis																						
M. perimagnus																						

*C = core; S = sidewall core; T = cuttings.

R = contaminants or reworked specimens

/ = rare

X = frequent

common (shaded band) = common

abundant (fully shaded) = abundant/dominant

Well Name KAHAWAI-1 Basin GIPPSLAND Sheet No 5 of 6

SAMPLE TYPE *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
PALYNOMORPHS / DEPTHS	1687.8	1719.5	1738.2	1749.2	1775.2	1791.3	1808.4	1820.0	1835.1	1895.6	1918.3	1932.7	1960.3	1966.9	1997.6	2005.1	2065.6	2096.1	2191.6	2271.4	2294.2	2307.5
M. subtilis	/	/	/																			
M. ornamentalis	/																					
M. hypolaenoides																						
M. homeopunctatus																						
M. parvus/mesonesus																						
M. tenuis																						
M. verrucosus																						
M. australis																						
N. asperus																						
N. asperoides	/		/									/										
N. brachyspinulosus				/			/												/			X
N. deminutus																						
N. emarcidus/heterus	/	/	/	/	/	/	/	/	/		/								/	/	/	
N. endurus	/	/	/	/				/				X						/	/			■
N. falcatus																						
N. flemingii	/		/																/			
N. goniatus																						
N. senectus																						
N. vansteenisii										R												
O. sentosa																						
P. ochesis																						
P. catastus	/	/		/				/														
P. demarcatus				/		/		/							/	/	/					/
P. magnus																						
P. polyoratus	X	/	/	/	/	/		/				X			/							/
P. vesicus																						
P. densus	X		/		/	/	/															
P. velosus								/														
P. morganii/jubatus																						
P. mawsonii	■		■	/	X	X	X	/	/			X	/	/	X	■			/	/	/	/
P. reticulosaccatus																/						/
P. verrucosus			/													/						
P. crescentis																						
P. esobalteus																						
P. langstonii		/	/			/																
P. reticulatus																						
P. simplex																						
P. varus																						
P. adenanthoides (Prot.)			X			/	/															
P. alveolatus																						
P. amolosexinus													/	/					/			
P. angulatus					/	/																
P. annularis	/		/																			
P. asperopolus																						
P. biornatus																						
P. clarus																						
P. cleinei												/	/	/		/					/	/
P. confragosus																						
P. crassus																						
P. delicatus																						
P. formosus																						
P. grandis																						
P. grevillaensis																						
P. incurvatus																						
P. intricatus																						
P. kopiensis																						
P. lapis																						
P. latrobensis																						
P. leightonii	R																					
P. obesolabrus																						
P. obscurus		R																				
P. ornatus																						
P. otwayensis												/	/	/						/	/	/
P. pachypolus																						
P. palisadus																/			/			
P. parvus																						
P. plemmelus																						
P. prodigus	/											/										
P. pseudomoides																						
P. recavus																						

* C=core: S=sidewall core: T=cutting

Well Name KAHAWAI-1 Basin GIPPSLAND Sheet No. 6 of 6

SAMPLE TYPE *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
PALYNOMORPHS / DEPTHS	1687.8	1719.5	1738.2	1749.2	1775.2	1791.3	1808.4	1820.0	1833.1	1895.6	1918.3	1932.7	1960.3	1966.9	1997.6	2005.1	2065.6	2096.1	2191.6	2271.4	2294.2	2307.5
P. rectomarginis																						
P. reflexus																						
P. reticulatus																						
P. reticuloconcavus													/	/	/				/	/	/	/
P. reticuloscabratus	/																					
P. rugulatus																						
P. scitus																						
P. stipplatus																						
P. tenuiexinus	/		/					/														
P. truncatus																						
P. tuberculatus																						
P. tuberculiformis																						
P. tuberculotumulatus																						
P. xestoformis (Prot.)																						
Q. brossus															/	/						
R. boxatus																						
R. stellatus																						
R. mallatus	/		/			/																
R. trophus																						
S. cainozoicus																						
S. rotundus																						
S. digitatoides																/						
S. marlinensis																						
S. rarus																						
S. meridianus	/		/			/		/		/			/	/								/
S. prominatus																						
S. uvatus																						
S. punctatus	/		/		/	/										/						
S. regium														/					/			
T. multistrixus (CP4)			/																			
T. textus	/																					
T. verrucosus			/			/		/		/		▓	/	/	/	X	▓					/
T. securus													/		/	/						
T. confessus (C3)			/										/	/	/	/			X	X		
T. gillii				/				/	/					X	▓	X		/	X	/	/	X
T. incisus																						
T. longus															/	X				/	/	
T. phillipsii	/		/					/			/											/
T. renmarkensis																						
T. sabulosus																						
T. simatus																						
T. thomasii																						
T. waiparaensis			/					/					/		/				/	/		/
T. adelaidensis (CP3)	/																					
T. angurium																						
T. delicatus																						
T. geraniodes																						
T. leuros																						
T. lilliei																/	/				/	
T. marginatus																						
T. moultonii																						
T. paenestriatus																						
T. retequetrus																						
T. scabratus																						
T. sphaerica																						
T. magnificus (P3)																						
T. spinosus																						
T. ambiguus																						
T. chnosus																						
T. helosus																						
T. scabratus																						
T. sectilis															/	/			/	/	/	/
V. attinatus																						
V. cristatus																						
V. kopukuensis	/																					
Proteacidites gemmatus							/					/	/			X				/		
Proteacidites wahooensis																/			/			

*C = core; S = sidewall core; T = cuttings.

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APPENDIX 3

APPENDIX 3

APPENDIX 3

QUANTITATIVE LOG ANALYSIS

KAHAWAI-1 LOG ANALYSIS

An analysis of wireline log data for the interval 1390.0 - 2303.5m of Kahawai-1 has been carried out using the HP41C "LOOKLOG II" analysis program. The analysed interval includes the Kahawai-1 pay zone (1401.5-1412.0m) which is the lateral equivalent of the Tuna Field M - 1.2 reservoir. The underlying sands are all water wet and have been analysed for porosity and volume of shale.

LOGS USED

GR, LLD, MSFL, LDT and CNL.

ANALYSIS AND SHALE PARAMETERS USED

a	0.8
m	2.0
n	2.0
Matrix density limits	2.65 - 2.67 gm/cc
Fluid density	1.0 gm/cc
Hydrocarbon density-oil	0.7 gm/cc
Apparent shale density	2.47 - 2.54 gm/cc
Apparent shale neutron porosity	34%
Apparent shale resistivity	3.0 - 9.0 ohm metres
Gamma ray minimum	22 API units
Gamma ray maximum	117 API units

Apparent shale density and resistivity increased with depth. Water saturations from these shale parameters gave satisfactory results.

SALINITIES

Apparent formation water salinities were calculated from a number of representative water sands using the standard "LOOKLOG II" option, these being from the SP, from ratioing resistivities and by backing out from the Archie relationship and from the Indonesia shaly sand relationship.

Each technique gave similar apparent formation water salinities in the order of 32,000 ppm NaCleq. This salinity appears to be consistent throughout the analysed section of Kahawai-1.

HYDROCARBONS

Log analysis of Kahawai-1 shows a 10.5m Top of "Coarse Clastics" oil accumulation from 1401.5m. The oil-water contact appears in good sand at 1412.0m.

Good probable oil productivity occurs over the zone 1402.5 to 1410.0 as Sw values (24-34%) are much lower than the Sxo values (85-90%) for this interval.

High Sw value occur in the zones 1401.5 - 1402.5 (78%) and 1410 - 1412.0 (61-86%). These zones are considered possibly oil productive.

Porosity in the probable oil productive zone averages 22%.

No indications of hydrocarbons were found in the intra-Latrobe Group section.

01731/8

L.J. FINLAYSON

23rd November, 1982.

KAHAWAI-1

LOG ANALYSIS SUMMARY SHEET

Depth Interval m	Thickness m	V. Shale %	Matrix Density gm/cc	Av. Porosity %	Sxo %	Sw %	Comment
1390.0 - 1393.5	3.5	77	-	-	-	-	Over 75% Shale, no analysis
1393.5 - 1395.0	1.5	9	2.64	29	72	54	Possible Gas *
1399.5 - 1401.5	2.0	93	-	-	-	-	Over 75% Shale, no analysis
1401.5 - 1402.5	1.0	46	2.66	8	100	77	Possible Oil Production
1402.5 - 1403.5	1.0	33	2.67	21	97	28	↑
1403.5 - 1405.5	2.0	10	2.65	26	92	24	
1405.5 - 1407.0	1.5	25	2.67	20	85	30	Probable Oil Production
1407.0 - 1408.0	1.0	18	2.67	24	95	30	
1408.0 - 1409.0	1.0	37	2.67	20	90	29	
1409.0 - 1410.0	1.0	32	2.66	17	87	34	
1410.0 - 1411.0	1.0	6	2.66	17	100	61	↓
1411.0 - 1412.0	1.0	23	2.66	18	97	86	Possible Oil Production
1412.0 - 1414.0	2.0	30	2.67	22	97	97	↓
1414.0 - 1416.0	2.0	15	2.67	22	97	97	Probable Water Production
1416.0 - 2303.5	Interbedded Shales, Siltstones, Coals and Sandstones - all water wet.						↓

* RFT pretests suggest low permeability.

L.J. FINLAYSON

APPENDIX 4

APPENDIX 4

WIRELINE TEST REPORT

KAHAWAI-1 RFT RUNS 1-3

During June 13 and 14, 1982, three RFT runs were made in Kahawai-1. A total of 32 seats were attempted, resulting in 25 successful pretests and three samples. Most of the pretests were done during run 1 with a long nose probe and RFT gauge only, while the samples were collected with a Martineau probe and both HP and RFT gauges.

With the exception of the Gurnard formation, all pressure build ups were rapid, indicating high formation permeability. Quantitative analysis was not possible because of plugging and/or rapid pressure build up.

Attachment 1 is a summary of the pressure and sampling results, while Figures 1 and 2 show plots of formation pressure vs depth. The major conclusions are as follows:

1. The Gurnard formation is probably gas bearing, although it also appears to be supercharged and tight.

2. The M-1 OWC is estimated to be 1412.0m MDKB (1391m ss), which confirms the log interpreted contact of 1390.5m ss and is a little deeper than the previously established contact of 1388.5m ss. The oil gradient is 0.90 psi/m and the water gradient is 1.42 psi/m. The measured M-1 pressures are in excellent agreement with the extrapolated Tuna A-10 L-1 (above MPM) water gradient, confirming that the M-1 reservoir is not drawndown by Gippsland production. This also confirms that the previous M-1 pressures measured during the Tuna A-5 RFT program were incorrect due to a gauge error.

3. Slight drawdown is evident in the water bearing sands corresponding to the Tuna L-1 reservoirs. This confirms previous expectations that the aquifer is quite large relative to the size of the reservoirs.

4. Drawdown in the lower part of the sands equivalent to the T-1 was generally around 160 psi, (compared with 175 psi measured in Tuna A-4A in January 1982) and both the bottom and top of T-1 seals are still intact at this location. This confirms that the water drive for the Tuna field is largely a flank water drive. The drawdown predicted for the Lower T-1 at the Kahawai-1 location by the Tuna aquifer model was 138 psi.

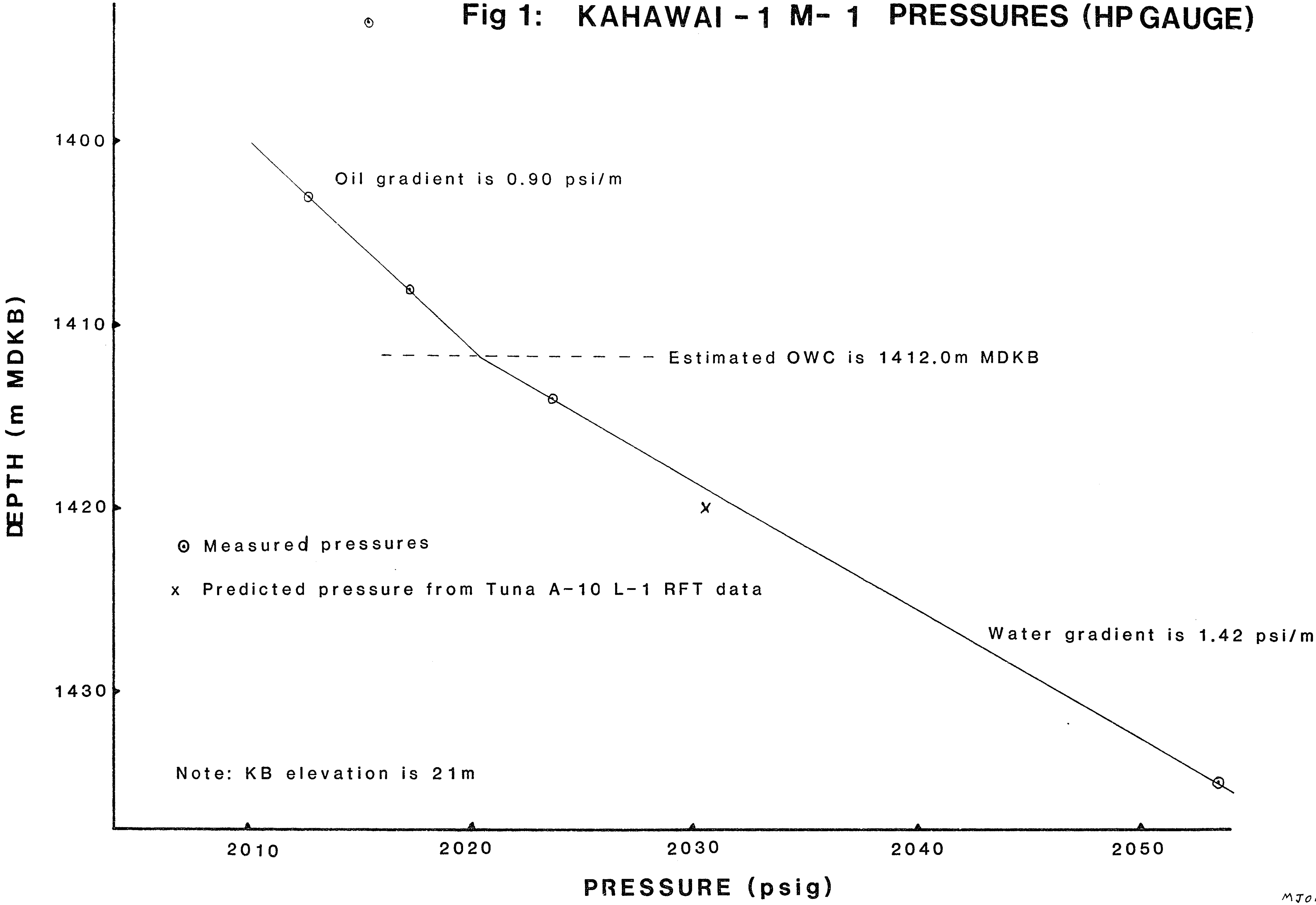
KAHAWAI-1

RFT INTERPRETATION

RUNS 1 - 3

Run/Seat	Depth	Formation Pressure		Comments
		RFT	HP	
	m MDKB	psig	psig	
1/1	1394.5	-		Slow leak
1/2	1394.0	2019		Supercharged
1/3	1403.0	2016		Fast build up, M-1 oil
1/4	1408.0	2022		Fast build up, M-1 oil
1/5	1414.0	2030		Fast build up
1/6	1767.5	2539		Fast build up
1/7	1861.0	2664		Fast build up, probably L-100
1/8	1903.5	2714		Fast build up, probably L-150/160
1/9	1928.0	2761		Fast build up, L-1.3
1/10	1964.0	2819		Fast build up
1/11	2070.0	2968		Fast build up
1/12	2126.0	-		Probe plugging
1/13	2126.5	2971		Slight plugging, T-1
1/14	2154.0	2932		Fast build up, T-1
1/15	2185.5	2974		Fast build up, T-1
1/16	2226.0	3031		Fast build up, T-1
1/17	2259.0	3082		Fast build up, T-1
1/18	2302.0	3305		Probe plugging
1/19	1393.5	2025		Fast build up
1/20	1403.0	2018		Sampling attempt - probe plugging
1/21	1393.5	2017		Sampling attempt - probe plugging
2/22	1403.0	2020	2012.8	Sample 1.06ft^3 gas, 15 l oil (49.6°API). Note that the gas leaked out of the 6 gallon chamber on the way out of the hole. One gallon segregated sample retained for PVT analysis.
3/23	1393.5	2025	2015.4	6 gallon chamber filled then seal failure prior to the one gallon filling. Recovery from the 6 gal chamber was 66cc filtrate and 0.11 ft^3 gas. The low recovery appears to be due to a mechanical problem with the tool.
3/24	1394.5	-	-	Slow leak
3/25	1394.5	-	-	Leaking, low pressure
3/26	1394.5	-	-	Sampling attempt - probe plugging and slow leak.
3/27	1408.0	2019	2017.3	Fast build up
3/28	1414.0	-	-	Slow leak
3/29	1414.0	2026	2023.7	Fast build up
3/30	1435.0	2058	2053.5	Fast build up
3/31A	1394.0	-	-	Sampling attempt - too tight
3/31B	1393.0	2019	2015	1 gallon sample taken, 3750cc filtrate, trace condensate and 0.2 ft^3 gas.

Fig 1: KAHAWAI - 1 M- 1 PRESSURES (HP GAUGE)



MJOB 9/82

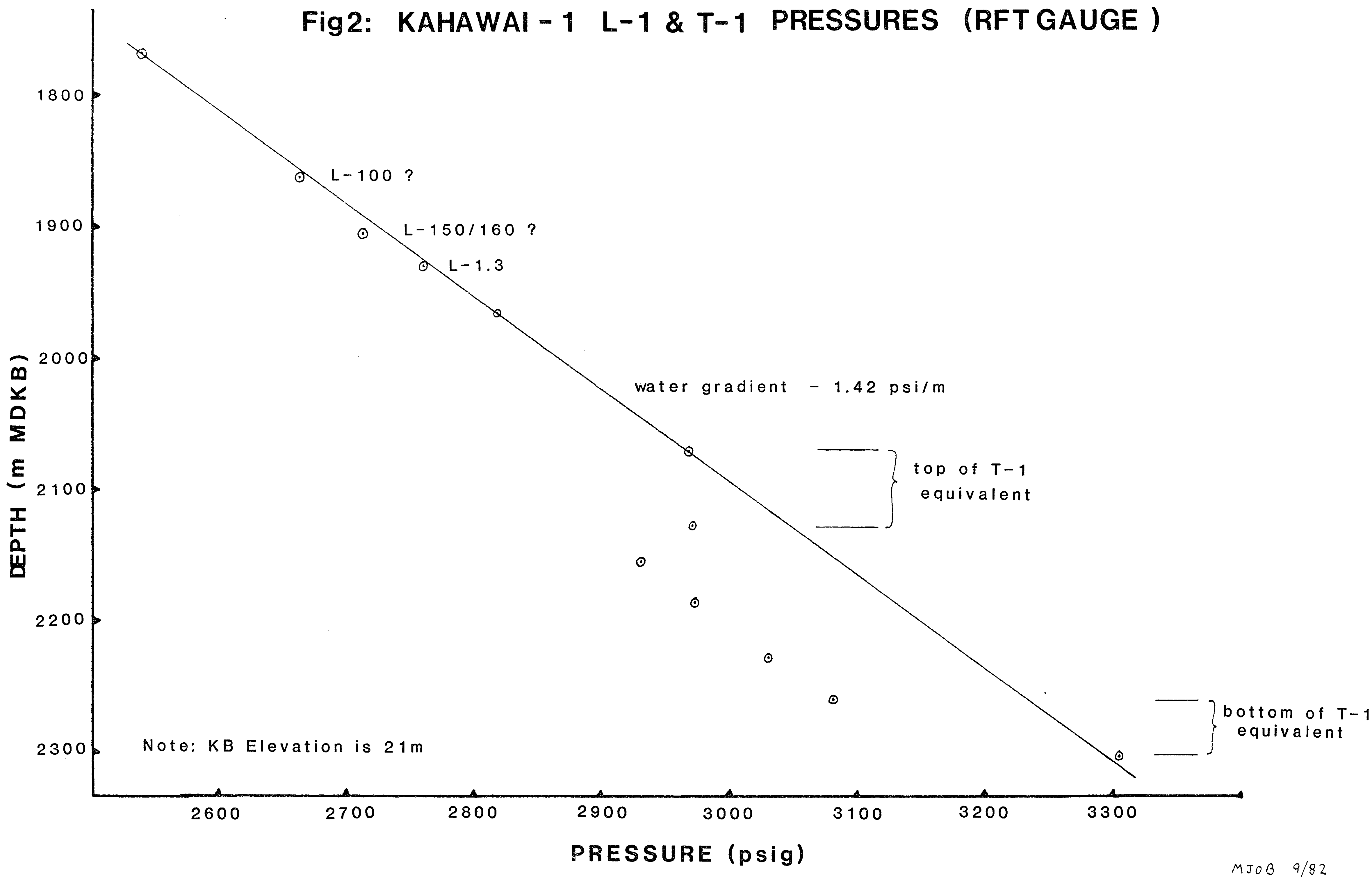


Fig2: KAHAWAI - 1 L-1 & T-1 PRESSURES (RFT GAUGE)
DEPTH (m MDKB)
1800
1900
2000
2100
2200
2300
L-100 ?
L-150/160 ?
L-1.3
water gradient - 1.42 psi/m
top of T-1
equivalent
bottom of T-1
equivalent
Note: KB Elevation is 21m
2600
2700
2800
2900
3000
3100
3200
3300
PRESSURE (psig)
MJOB 9/82

RFT PRETEST PRESSURES

SERVICE COMPANY: ..SCHLUMBERGER.......... RFT RUN. NO: ...ONE........

WELL : ..KAHAWAI - 1........
DATE : ..14/6/82............
OBSERVERS : .L. FINLAYSON....

SEAT NO.	DEPTH	DEPTH (Ss)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
1/1	1394.5	1373.5	PT	SCH	Y	G	2470	10.30	-	-	2480	10.34	Seal Failure
1/2	1394.0	1373.0	PT	SCH	Y	G	2468	10.29	2019	8.55	2471	10.31	Valid
1/3	1403.0	1382.0	PT	SCH	Y	G	2484	10.29	2016	8.48	2586	10.72	Valid
1/4	1408.0	1387.0	PT	SCH	Y	G	2495	10.30	2022	8.48	2496	10.31	Valid
1/5	1414.0	1393.0	PT	SCH	Y	G	2506	10.30	2030	8.47	2507	10.31	Valid
1/6	1767.5	1746.5	PT	SCH	Y	G	3142	10.34	2539	8.45	3144	10.34	Valid
1/7	1861.0	1840.0	PT	SCH	Y	G	3316	10.36	2664	8.42	3315	10.36	Valid

1. Pressure Test = PT
   Sample & Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   = HP = Hewlett Packard
3. Yes = Y
   No = N
4. PSIA = A
   PSIG = G

RFT PRETEST PRESSURES

SERVICE COMPANY: SCHLUMBERGER RFT RUN. NO: ONE

WELL : KAHAWAI - 1
DATE : 14/6/82
OBSERVERS : L. FINLAYSON

SEAT NO.	DEPTH	DEPTH (Ss)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
1/8	1903.5	1882.5	PT	SCH	Y	G	3372	10.30	2714	8.38	3372	10.30	Valid
1/9	1928.0	1907.0	PT	SCH	Y	G	3416	10.30	2761	8.42	3417	10.30	Valid
1/10	1964.0	1943.0	PT	SCH	Y	G	3478	10.30	2819	8.44	3480	10.30	Valid
1/11	2070.0	2049.0	PT	SCH	Y	G	3667	10.30	2968	8.42	3666	10.30	Valid
1/12	2126.0	2105.0	PT	SCH	Y	G	3766	10.30	-	-	3769	10.31	Probe Plugged
1/13	2126.5	2105.5	PT	SCH	Y	G	3770	10.31	2971	8.20	3771	10.31	Valid
1/14	2154.0	2133.0	PT	SCH	Y	G	3819	10.31	2932	7.99	3820	10.31	Valid

1. Pressure Test = PT
   Sample & Pressure Test = SPT
2. Gauges = SCH = Schlumberger Strain Gauge
   = HP = Hewlett Packard
3. Yes = Y
   No = N
4. PSIA = A
   PSIG = G

RFT PRETEST PRESSURES

SERVICE COMPANY: SCHLUMBERGER RFT RUN. NO: ONE

WELL : KAHAWAI - 1
DATE : 14/6/82
OBSERVERS : L. FINLAYSON

SEAT NO.	DEPTH	DEPTH (Ss)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
1/15	2185.5	2164.5	PT	SCH	Y	G	3875	10.31	2974	7.99	3876	10.31	Valid
1/16	2226.0	2205.0	PT	SCH	Y	G	3939	10.29	3031	7.99	3941	10.29	Valid
1/17	2259.0	2238.0	PT	SCH	Y	G	4014	10.33	3082	8.01	4016	10.34	Valid
1/18	2302.0	2281.0	PT	SCH	Y	G	4084	10.31	3305	8.42	4084	10.31	Valid
1/19	1393.5	1372.5	PT	SCH	Y	G	2473	10.32	2025	8.58	2471	10.31	Valid
1/20	1403.0	1382.0	SPT	SCH	Y	G	2484	10.29	2018	8.49	2484	10.29	Valid
1/21	1393.5	1372.5	SPT	SCH	N	G	2464	10.27	2017	8.54	2465	10.28	Valid

1. Pressure Test = PT
   Sample & Pressure Test = SPT

2. Gauges = SCH = Schlumberger Strain Gauge
   = HP = Hewlett Packard

3. Yes = Y
   No = N

4. PSIA = A
   PSIG = G

RFT PRETEST PRESSURES

SERVICE COMPANY: ..SCHLUMBERGER.........RFT RUN. NO: One to Three

WELL : KAHAWAI - 1
DATE : 14/6/82
OBSERVERS : L. FINLAYSON

SEAT NO.	DEPTH	DEPTH (Ss)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
2/22	1403.0	1382.0	SPT	SCH	N	G	2498	10.35	2020	8.50	2501	10.36	Valid
				HP	Y	A	2492.3	10.33	2012.8	8.47	2491.2	10.32	
3/23	1393.5	1372.5	SPT	SCH	N	G	2473	10.32	2025	8.58	-	-	Valid
				HP	Y	A	2472.5	10.32	2015.4	8.54	-	-	
3/24	1393.5	1372.5	SPT	SCH	Y	G	2473	10.32	-	-	-	-	Seal Failure
				HP	Y	G	2472.3	10.31	-	-	-	-	
3/25	1394.5	1373.5	SPT	SCH	Y	G	2475	10.32	-	-	-	-	Seal Failure
				HP	Y	G	2475.3	10.32	-	-	-	-	
3/26	1394.5	1373.5	SPT	SCH	Y	G	2475	10.32	-	-	-	-	Seal Failure
				HP	Y	G	2475.3	10.32	-	-	-	-	
3/27	1408.0	1387.0	PT	SCH	Y	G	2495	10.30	2019	8.46	2495	10.30	Valid
				HP	Y	G	2495.4	10.30	2017.3	8.46	2495.3	10.30	
3/28	1414.0	1393.0	PT	SCH	Y	G	2505	10.30	-	-	-	-	Seal Failure
				HP	Y	G	2507.1	10.31	-	-	-	-	

1. Pressure Test = PT
   Sample & Pressure Test = SPT

2. Gauges = SCH = Schlumberger Strain Gauge
   = HP = Hewlett Packard

3. Yes = Y
   No = N

4. PSIA = A
   PSIG = G

RFT PRETEST PRESSURES

SERVICE COMPANY: SCHLUMBERGER RFT RUN. NO: THREE

WELL : KAHAWAI - 1
DATE : 15/6/82
OBSERVERS : L. FINLAYSON

SEAT NO.	DEPTH	DEPTH (Ss)	REASON 1 FOR TEST	GAUGE 2	TEMP 3 CORR.	UNITS 4	IHP psi	IHP ppg	FORMATION PRESSURE psi	FORMATION PRESSURE ppg	FHP psi	FHP ppg	TEST RESULT
3/29	1414.0	1393.0	PT	SCH	Y	G	2505	10.30	2026	8.46	2505	10.30	Valid
				HP	Y	G	2506.3	10.31	2023.7	8.45	2505.1	10.30	
3/30	1435.0	1414.0	PT	SCH	Y	G	2544	10.31	2058	8.46	2545	10.31	Valid
				HP	Y	G	2543.0	10.30	2053.5	8.44	2543.3	10.30	
3/31A	1394.0	1373.0	SPT	SCH	Y	G	2474	10.32	-	-	-	-	Tight
				HP	Y	G	2471.5	10.31	-	-	-	-	
3/31B	1393.0	1372.0	SPT	SCH	Y	G	2471	10.31	2019	8.56	2472	10.32	Valid
				HP	Y	G	2469.2	10.31	2015.0	8.54	2467.4	10.30	

1. Pressure Test = PT
   Sample & Pressure Test = SPT

2. Gauges = SCH = Schlumberger Strain Gauge
   = HP = Hewlett Packard

3. Yes = Y
   No = N

4. PSIA = A
   PSIG = G

RFT SAMPLE TEST REPORT

WELL : KAHAWAI - 1

OBSERVER : L. FINLAYSON DATE : 14/6/82 RUN NO.: 3

	CHAMBER 1 (22.7 lit.)		CHAMBER 2 (3.8 lit.)	
SEAT NO.	23		31B	
DEPTH	1393.5m		1393.0m	
A.RECORDING TIMES				
Tool Set	11-09-00		12-48-00	
Pretest Open	11-09-10		12-48-05	
Time Open	2-50		1-40	
Chamber Open	11-12-00		12-49-45	
Chamber Full	11-18-24		1-01-40	
Fill Time	6-24		11-55	
Start Build up	11-18-24		1-01-40	
Finish Build up	-		-	
Build Up time	-		-	
Seal Chamber	11-18-24		1-05-00	
Tool Retract				
Total Time	0-09-24	hrs.	0-17-00	hrs.
B.SAMPLE PRESSURES				
IHP	2787.2	psig		psig
ISIP	1443.0		542.0	
Initial Flowing Press.	2015.0		1202.6	
Final Flowing Press.	2028.4		2028.4	
Sampling Press. Range	585.4		1486.4	
FSIP	2029.6		2029.0	
FHP	-		2482.1	
Form.Press.(Horner)				
C.TEMPERATURE				
Depth Tool Reached	1435	m		m
Max.Rec.Temp.		°C		°C
Time Circ. Stopped		hrs.		hrs.
Time since Circ.		hrs.		hrs.
Form.Temp.(Horner)		°C		°C
D.SAMPLE RECOVERY				
Surface Pressure	0	psig	0	psig
Amt Gas	0.11 cu ft		0.18 cu ft	
Amt oil	0	lit.	0	lit.
Amt Water	0.60	lit.	3.75	lit.
Amt Others	0	lit.	Condensate Scum	lit.
E.SAMPLE PROPERTIES				
Gas Composition				
C1	901	ppm	901	ppm
C2	9,539	ppm	2120	ppm
C3	28,611	ppm	5852	ppm
IC4/nC4	9,818	ppm	6042	ppm
C5	2,109	ppm	3692	ppm
C6+	117	ppm	1413	ppm
CO2/H2S	0.1%/0	ppm	tr/0	ppm
Oil Properties	- °API@	°C	- °API@	°C
Colour	-		-	
Fluorescence	-		-	
GOR	-		-	
Water Properties				
Resistivity	0.32 @ 15.5	°C	0.28 @ 17.8	°C
NaCl Equivalent		ppm		ppm
Cl-titrated	16,000	ppm	20,000	ppm
NO3	8	ppm	12	ppm
Est.Water Type				
Mud Properties				
Resistivity	@°C		@°C	
NaCl Equivalent	21,000	ppm		ppm
Cl- titrated		ppm		ppm
Calibration				
Calibration Press.		psig		psig
Calibration Temp.		°C		°C
Hewlett Packard No.	0688		0688	
Mud Weight	10.0		10.0	
Calc.Hydrostatic				
RFT Chokesize	1 x 0.04"		1 x 0.02"	
REMARKS				

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RFT SAMPLE TEST REPORT

WELL : KAHAWAI - 1

OBSERVER : L. FINLAYSON DATE : 14/6/82 RUN NO.: 2

	CHAMBER 1 (22.7 lit.)	CHAMBER 2 (3.8 lit.)
SEAT NO.	22	22
DEPTH	1403m	1403m
A. RECORDING TIMES		
Tool Set	7-54-28	
Pretest Open	7-55-00	
Time Open	1-00	
Chamber Open	7-56-00	8-09-15
Chamber Full	8-08-08	8-10-00
Fill Time	12-08	1-15
Start Build up	8-08-08	8-10-00
Finish Build up		8-14-00
Build Up time		4-00
Seal Chamber	8-08-08	8-10-00
Tool Retract		8-15-30
Total Time	hrs.	20-34 hrs.
B. SAMPLE PRESSURES		
IHP	2507.0 psig	psig
ISIP		
Initial Flowing Press.	1776.9	1828.8
Final Flowing Press.	2027.0	2027.0
Sampling Press. Range		
FSIP	2027.2	2027.1
FHP		2505.9
Form.Press.(Horner)		
C. TEMPERATURE		
Depth Tool Reached	1403 m	m
Max.Rec.Temp.	°C	°C
Time Circ. Stopped	hrs.	hrs.
Time since Circ.	hrs.	hrs.
Form.Temp.(Horner)	°C	°C
D. SAMPLE RECOVERY		
Surface Pressure	0 psig	psig
Amt Gas	1.06 cu ft	lit.
Amt oil	15 lit.	lit.
Amt Water	0 lit.	lit.
Amt Others	0 lit.	lit.
E. SAMPLE PROPERTIES		SAMPLE PRESERVED
Gas Composition		
C1	1802 ppm	ppm
C2	2826 ppm	ppm
C3	42916 ppm	ppm
IC4/nC4	184269 ppm	ppm
C5	69612 ppm	ppm
C6+	14131 ppm	ppm
CO2/H2S	0.5%/0 ppm	ppm
Oil Properties	49.6 °API@ 15.5 °C	°API@ °C
Colour	Dark Brown-Gold	
Fluorescence	Yellow-Blue-White	
GOR		
Water Properties		
Resistivity	0.071 @ 76.6 °C	@ °C
NaCl Equivalent	21,000 ppm	ppm
Cl-titrated	ppm	ppm
NO3	ppm	ppm
Est.Water Type		
Mud Properties		
Resistivity	0.071 @°C 76.6	@°C
NaCl Equivalent	21,000 ppm	ppm
Cl- titrated	ppm	ppm
Calibration		
Calibration Press.	psig	psig
Calibration Temp.	°C	°C
Hewlett Packard No.	0688	0688
Mud Weight	10.0	10.0
Calc.Hydrostatic		
RFT Chokesize	1 x 0.04"	1 x 0.02"
REMARKS		

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APPENDIX 5

Appendix 5

APPENDIX 5

GEOCHEMICAL REPORT

GEOCHEMICAL REPORT
KAHAWAI-1 WELL, GIPPSLAND BASIN, VICTORIA

by

J.K. Emmett.

Esso Australia Ltd.

Geochemical Report.

0297L

December 1982.

CONTENTS

INTRODUCTION

Various geochemical analyses were performed on canned cuttings and sidewall core samples taken during drilling of Kahawai-1, Gippsland Basin, Victoria. Canned cuttings composited over 15 metre intervals were collected from 230 metres (K.B.) down to Total Depth (T.D.), 2320 metres (K.B.). C_{1-4} headspace hydrocarbon gas content was determined for alternate 15- metre intevals over the whole sequence, and between 1070m metres and 2310 metres, succeeding alternate 15 metre intervals were analysed for C_{4-7} gasoline range hydrocarbons. Samples were then selected for more detailed analyses, such as Total Organic Carbon (T.O.C.), kerogen isolation and elemental analysis and C_{15+} liquid and gas chromatography. Vitrinite Reflectance ($\bar{R}_o$) measurements were performed by Professor A.C. Cook of Wollongong.

Oil shows were encountered in Kahawai-1 between about 1393m (K.B.) and 1414m (K.B.) (this section is thought to be equivalent to the Tuna M 1.2 reservoir) and an oil sample RFT-2 at 1403m was analysed for API gravity, % sulphur, whole oil -, C_{4-7} and C_{15+} gas chromatography and C_{15+} liquid chromatography.

DISCUSSION OF RESULTS

The detailed headspace C_{1-4} hydrocarbon gas analysis data are listed in Table-1 and for convenience have been plotted in Figure-1. The C_{1-4} gas content varies from low to moderately rich down to the top of the Labrobe Group coarse clastics at about 1468m, below which the values are uniformly quite rich (generally over 5000 ppm). A good hydrocarbon source potential is therefore indicated for the Latrobe Group Sediments. The amount of wet (C_{2+}) gas components is generally low over the whole sequence, but reaches about 50% at 1265-1280 metres and again at 1410-1425 metres. Oil shows were encountered in the vicinity of the latter zone and are partly responsible for this high wet gas value.

The detailed C_{4-7} gasoline-range hydrocarbon analyses are presented in Appendix 1 and have also been plotted in Figure 2. Values in the Lakes Entrance Formation are low and these sediments would be rated as having a poor potential to source hydrocarbons. C_{4-7} values in the Latrobe Group vary from very low to very rich reflecting the variation in the sediment pile from relatively organic barren sands through shales and siltstones of varying organic content, to coals and coal/sediment mixtures, rich in gasoline range hydrocarbons. Overall, the very good hydrocarbon source rating for the Latrobe group sediments is however, confirmed.

Total Organic Carbon (T.O.C.) values (Table 2) for the Latrobe Group sediments are quite rich with an average T.O.C. = 1.99% (or 2.18% for the undifferentiated Latrobe Group). A single T.O.C. determination (0.29%) in the overlying Lakes Entrance Formation suggests that this unit has a poor hydrocarbon source potential, as indicated in studies from other wells.

Vitrinite reflectance data from sidewall cores samples, Table 3 and Appendix-2 indicates that the entire section penetrated is still presently immature (taking R_o max = 0.65% as the top of the maturity window for significant hydrocarbon generation). In the samples observed, oil-prone exinite macerals were generally common, again indicating that that Latrobe Group sediments, where they are mature, would have very good hydrocarbon source potential.

In Table 4, elemental analyses of selected kerogen samples isolated from sidewall cores are presented. Approximate Hydrogen: Carbon (H/C), Oxygen: carbon (O/C) and Nitrogen: carbon (N/C); atomic ratios for these samples are given in Table 5. These ratios are approximate as the oxygen % is calculated by difference, and the naturally occurring organic sulphur % (which may be up to a few percent) was not determined. Figure 3 is a modified Van Krevelen Plot of atomic H/C versus atomic O/C ratio, delineating the basic kerogen types. Comparison of Figure 3 with Figure 4, a similar plot showing the "Principal Products of Kerogen Evolution", confirms that kerogens from the Latrobe Group sediments are immature and composed of woody-herbaceous organic matter. This organic matter has atomic H/C ratios sufficiently high enough to be indicative of very good potential to generate both oil and gas.

The C_{15+} liquid chromatography results from selected canned cuttings are listed in Table 6. The immaturity of the Latrobe Group sediments is again reflected in the composition of the solvent extracts, with the amount of hydrocarbons being relatively small compared to the non-hydrocarbons (Asphaltenes and N.S.O. compounds). The corresponding C_{15+} saturate chromatograms are shown in Figure 5-10. Figure 5 from the Flounder Formation toward the top of the Latrobe Group sediments, shows a mixture of marine and non-marine organic matter as indicated by the bi-modal distribution on n-alkanes. The abundant lower molecular weight n-alkanes maximising at n-C_{19} represent the marine contribution, whilst the n-C_{29} maxima and the odd-over-even predominance exhibited in the higher molecular weight n-alkanes are typical of immature non-marine/terrestrial organic matter.

The remaining chromatograms (Figures 6-10) are fairly similar in appearance, indicating primarily immature non-marine/terrestrial organic matter.

Table 7 gives the C_{4-7} gasoline-range hydrocarbon data for an oil sample, RFT-2 at 1403 m recovered from Kahawai-1. This sample has an API gravity of 47.3% (at 60^{o}F) and a sulphur content of 0.15%. The C_{15+} liquid chromatography results for this oil (Table 8), and the "whole oil" and C_{15+}-gas chromatographs (figures 11 and 12 respectively) indicate that the Kahawai-1 oil has been quite severely altered. The marked depletion of n-alkanes evident in both chromatograms is indicative of biodegradation. Oil with a similar saturate compound distribution occurs in the Tuna M 1.2 reservoir. The oil zone encountered in Kahawai-1 has been assumed to be equivalent to the Tuna M 1.2 reservoir. The oil geochemistry results confirm this association.

Table 1 :

C1-C4 HYDROCARBON ANALYSES

REPORT A - HEADSPACE GAS

BASIN - GIPPSLAND
WELL - KAHAWAI 1

SAMPLE NO.	DEPTH	GAS CONCENTRATION (VOLUME GAS PER MILLION VOLUMES CUTTINGS)								GAS COMPOSITION (PERCENT)								
		METHANE C1	ETHANE C2	PROPANE C3	IBUTANE IC4	NBUTANE C4	WET C2-C4	TOTAL C1-C4	WET/TOTAL PERCENT	TOTAL GAS M	E	P	IB	NB	WET GAS E	P	IB	NB
72458 B	245.00	2	0	0	0	0	0	2	.00	100.	0.	0.	0.	0.	0.	0.	0.	0.
72458 D	275.00	1	0	0	0	0	0	1	.00	100.	0.	0.	0.	0.	0.	0.	0.	0.
72458 F	305.00	844	29	18	7	5	59	903	6.53	93.	3.	2.	1.	1.	49.	31.	12.	8.
72458 H	335.00	4134	112	57	12	7	188	4322	4.35	96.	3.	1.	0.	0.	60.	30.	6.	4.
72458 J	365.00	76	3	1	0	0	4	80	5.00	95.	4.	1.	0.	0.	75.	25.	0.	0.
72458 L	395.00	275	15	4	1	1	21	296	7.09	93.	5.	1.	0.	0.	71.	19.	5.	5.
72458 N	425.00	137	4	1	0	0	5	142	3.52	96.	3.	1.	0.	0.	80.	20.	0.	0.
72458 P	455.00	890	29	19	2	1	51	941	5.42	95.	3.	2.	0.	0.	57.	37.	4.	2.
72458 R	485.00	308	9	2	0	0	11	319	3.45	97.	3.	1.	0.	0.	82.	18.	0.	0.
72458 T	515.00	117	5	3	0	0	8	125	6.40	94.	4.	2.	0.	0.	63.	38.	0.	0.
72458 V	545.00	518	16	3	0	0	19	537	3.54	96.	3.	1.	0.	0.	84.	16.	0.	0.
72458 X	575.00	10	0	0	0	0	0	10	.00	100.	0.	0.	0.	0.	0.	0.	0.	0.
72458 Z	605.00	0	0	0	0	0	0	0	.00	0.	0.	0.	0.	0.	0.	0.	0.	0.
72459 B	650.00	472	31	22	5	0	58	530	10.94	89.	6.	4.	1.	0.	53.	38.	9.	0.
72459 F	710.00	1349	88	23	7	3	121	1470	8.23	92.	6.	2.	0.	0.	73.	19.	6.	2.
72459 H	740.00	3644	119	30	9	4	162	3806	4.26	96.	3.	1.	0.	0.	73.	19.	6.	2.
72459 J	770.00	1320	45	10	4	1	60	1380	4.35	96.	3.	1.	0.	0.	75.	17.	7.	2.
72459 L	800.00	896	32	21	6	1	60	956	6.28	94.	3.	2.	1.	0.	53.	35.	10.	2.
72459 N	830.00	0	0	0	0	0	0	0	.00	0.	0.	0.	0.	0.	0.	0.	0.	0.
72459 P	860.00	0	0	1	1	0	2	2	100.00	0.	0.	50.	50.	0.	0.	50.	50.	0.
72459 R	890.00	1	0	0	0	0	0	1	.00	100.	0.	0.	0.	0.	0.	0.	0.	0.
72459 T	920.00	483	17	6	3	1	27	510	5.29	95.	3.	1.	1.	0.	63.	22.	11.	4.
72459 V	950.00	2987	45	30	12	5	92	3079	2.99	97.	1.	1.	0.	0.	49.	33.	13.	5.
72459 X	980.00	2140	30	26	9	4	69	2209	3.12	97.	1.	1.	0.	0.	43.	38.	13.	6.
72459 Z	1010.00	3591	84	56	26	13	179	3770	4.75	95.	2.	1.	1.	0.	47.	31.	15.	7.
72460 B	1040.00	1357	18	15	6	3	42	1399	3.00	97.	1.	1.	0.	0.	43.	36.	14.	7.
72460 D	1070.00	1242	31	21	9	4	65	1307	4.97	95.	2.	2.	1.	0.	48.	32.	14.	6.
72460 F	1100.00	1729	28	31	23	8	90	1819	4.95	95.	2.	2.	1.	0.	31.	34.	26.	9.
72460 H	1130.00	1442	32	29	13	6	80	1522	5.26	95.	2.	2.	1.	0.	40.	36.	16.	7.
72460 J	1160.00	1119	27	21	9	4	61	1180	5.17	95.	2.	2.	1.	0.	44.	34.	15.	7.
72460 L	1190.00	1669	39	26	10	5	80	1749	4.57	95.	2.	1.	1.	0.	49.	32.	13.	6.
72460 N	1220.00	916	25	15	6	0	46	962	4.78	95.	3.	2.	1.	0.	54.	33.	13.	0.
72460 P	1250.00	681	22	12	5	3	42	723	5.81	94.	3.	2.	1.	0.	52.	29.	12.	7.
72460 R	1280.00	970	25	1232	0	0	1257	2227	56.44	44.	1.	55.	0.	0.	2.	98.	0.	0.
72460 T	1310.00	1578	83	55	9	5	152	1730	8.79	91.	5.	3.	1.	0.	55.	36.	6.	3.
72460 V	1340.00	663	46	33	6	5	90	753	11.95	88.	6.	4.	1.	1.	51.	37.	7.	6.
72460 X	1370.00	496	35	29	5	5	74	570	12.98	87.	6.	5.	1.	1.	47.	39.	7.	7.
72460 Z	1400.00	581	51	68	25	47	191	772	24.74	75.	7.	9.	3.	6.	27.	36.	13.	25.
72461 B	1425.00	486	180	276	98	181	735	1221	60.20	40.	15.	23.	8.	15.	24.	38.	13.	25.
72461 D	1455.00	113	23	15	4	4	46	159	28.93	71.	14.	9.	3.	3.	50.	33.	9.	9.
72461 F	1485.00	79391	5057	413	46	17	5533	84924	6.52	93.	6.	0.	0.	0.	91.	7.	1.	0.
72461 H	1515.00	96162	5269	239	42	10	5560	101722	5.47	95.	5.	0.	0.	0.	95.	4.	1.	0.
72461 J	1545.00	20860	1210	102	19	7	1338	22198	6.03	94.	5.	0.	0.	0.	90.	8.	1.	1.
72461 L	1575.00	6276	481	52	14	6	553	6829	8.10	92.	7.	1.	0.	0.	87.	9.	3.	1.
72461 N	1605.00	25017	1018	66	16	0	1100	26117	4.21	96.	4.	0.	0.	0.	93.	6.	1.	0.
72461 P	1635.00	16700	1016	112	26	7	1161	17861	6.50	93.	6.	1.	0.	0.	88.	10.	2.	1.
72461 R	1665.00	4119	303	26	7	2	338	4457	7.58	92.	7.	1.	0.	0.	90.	8.	2.	1.

Table 1 cont.

C1-C4 HYDROCARBON ANALYSES

REPORT A - HEADSPACE GAS

BASIN - GIPPSLAND
WELL - KAHAWAI 1

SAMPLE NO.	DEPTH	METHANE C1	ETHANE C2	PROPANE C3	IBUTANE IC4	NBUTANE C4	WET C2-C4	TOTAL C1-C4	WET/TOTAL PERCENT	TOTAL GAS M	TOTAL GAS E	TOTAL GAS P	TOTAL GAS IB	TOTAL GAS NB	WET GAS E	WET GAS P	WET GAS IB	WET GAS NB
		GAS CONCENTRATION (VOLUME GAS PER MILLION VOLUMES CUTTINGS)								GAS COMPOSITION (PERCENT)								
72461 T	1695.00	7319	481	49	16	6	552	7871	7.01	93.	6.	1.	0.	0.	87.	9.	3.	1.
72461 V	1725.00	8606	648	63	11	3	725	9331	7.77	92.	7.	1.	0.	0.	89.	9.	2.	0.
72461 X	1755.00	6198	931	133	27	9	1100	7298	15.07	85.	13.	2.	0.	0.	85.	12.	2.	1.
72461 Z	1785.00	27505.	1441	90	21	5	1557	29062	5.36	95.	5.	0.	0.	0.	93.	6.	1.	0.
72462 B	1815.00	8800	538	58	13	3	612	9412	6.50	93.	6.	1.	0.	0.	88.	9.	2.	0.
72462 D	1845.00	11038	701	108	23	10	842	11880	7.09	93.	6.	1.	0.	0.	83.	13.	3.	1.
72462 F	1875.00	9634	1129	218	23	11	1381	11015	12.54	87.	10.	2.	0.	0.	82.	16.	2.	1.
72462 H	1905.00	8416	1415	395	33	23	1866	10282	18.15	82.	14.	4.	0.	0.	76.	21.	2.	1.
72462 J	1935.00	27674	5216	2114	247	275	7852	35526	22.10	78.	15.	6.	1.	1.	66.	27.	3.	4.
72462 L	1965.00	3155	630	341	42	45	1058	4213	25.11	75.	15.	8.	1.	1.	60.	32.	4.	4.
72462 N	1995.00	5000	1393	741	89	96	2319	7319	31.68	68.	19.	10.	1.	1.	60.	32.	4.	4.
72462 P	2025.00	1439	434	283	42	51	810	2249	36.02	64.	19.	13.	2.	2.	54.	35.	5.	6.
72462 R	2055.00	7582	2179	1087	131	164	3561	11143	31.96	68.	20.	10.	1.	1.	61.	31.	4.	5.
72462 T	2085.00	27838	3547	1051	121	114	4833	32671	14.79	85.	11.	3.	0.	0.	73.	22.	3.	2.
72462 V	2115.00	10358	1105	272	22	17	1416	11774	12.03	88.	9.	2.	0.	0.	78.	19.	2.	1.
72462 X	2145.00	3496	820	280	33	27	1160	4656	24.91	75.	18.	6.	1.	1.	71.	24.	3.	2.
72462 Z	2175.00	3472	556	311	44	51	962	4434	21.70	78.	13.	7.	1.	1.	58.	32.	5.	5.
72463 B	2205.00	4401	1303	520	67	71	1961	6362	30.82	69.	20.	8.	1.	1.	66.	27.	3.	4.
72463 D	2235.00	13073	2435	718	77	73	3303	16376	20.17	80.	15.	4.	0.	0.	74.	22.	2.	2.
72463 F	2265.00	1394	278	27	16	15	336	1730	19.42	81.	16.	2.	1.	1.	83.	8.	5.	4.
72463 H	2295.00	9398	1757	575	62	61	2455	11853	20.71	79.	15.	5.	1.	1.	72.	23.	3.	2.
72463 J	2325.00 (20)	7625	1208	463	62	83	1816	9441	19.24	81.	13.	5.	1.	1.	67.	25.	3.	5.

Table 2.

TOTAL ORGANIC CARBON REPORT

BASIN - GIPPSLAND
WELL - KAHAWAI 1

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	TOC%	DESCRIPTION
72460 E	1085.00	MIOCENE	LAKES ENTRANCE	2	.45					LT.OL-GY SHALE,V.CALC.
72460 G	1115.00	MIOCENE	LAKES ENTRANCE	2	.41					MED.OL-GY SLTY SH,CALC.
72460 I	1145.00	MIOCENE	LAKES ENTRANCE	2	.46					MED-GY,MOD.CALC.SHALE
72460 K	1175.00	MIOCENE	LAKES ENTRANCE	2	.44					OL-GY V.CALC,FOSSILIF.SH
72460 M	1205.00	MIOCENE	LAKES ENTRANCE	2	.42					MED.OL-GY V.CALC.SHALE
72460 O	1235.00	MIOCENE	LAKES ENTRANCE	2	.43					MED.GY,SLTY,V.CALC.SHALE
72460 Q	1265.00	MIOCENE	LAKES ENTRANCE	2	.47					MED.GY,V.CALC.SHALE
72460 S	1295.00	MIOCENE	LAKES ENTRANCE	2	.48					MED.GY V.CALC,SHALE
72460 U	1325.00	MIOCENE	LAKES ENTRANCE	2	.48					MED.GY SLTY,MOD CALC.SH.
72460 W	1355.00	MIOCENE	LAKES ENTRANCE	2	.41					MED.GY SLTY MOD.CALC.SH.
72447 H	1357.00	MIOCENE	LAKES ENTRENCE	1	.29					M. OLGRY CLYST.CARB SPKS
72460 Y	1385.00	MIOCENE	LAKES ENTRANCE	2	.40					MED.OL-GY,V.CALC.SHALE

===> DEPTH : .00 TO 1386.00 METRES. <=== I ===> AVERAGE TOC : .43 % EXCLUDING VALUES GREATER THAN 10.00 % <===

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	TOC%	DESCRIPTION
72447 G	1391.20	EOCENE-PALEOCENE	LATROBE GP-GURNARD FM.	1	.51					OLGRY,MUDDY QTZ,SH&CARB.

===> DEPTH : 1391.00 TO 1392.00 METRES. <=== I ===> AVERAGE TOC : .51 % EXCLUDING VALUES GREATER THAN 10.00 % <===

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	TOC%	DESCRIPTION
72461 A	1410.00	EOCENE-PALEOCENE	LATROBE GP-FLOUNDER FM.	2	.42					MED.GRN-GY,V.CALC.SHALE
72461 C	1440.00	EOCENE-PALEOCENE	LATROBE GP-FLOUNDER FM.	2	.37					MED.OL-GY V.CALC.SHALE

===> DEPTH : 1409.00 TO 1441.00 METRES. <=== I ===> AVERAGE TOC : .40 % EXCLUDING VALUES GREATER THAN 10.00 % <===

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	TOC%	DESCRIPTION
72461 E	1470.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.43					MED.OL-GY V.CALC.SHALF
72447 J	1495.20	EOCENE-PALEOCENE	LATROBE GROUP	1	2.65					DK GRY CLYST/WH SLST.
72461 G	1500.00	EOCENE-PALEOCENE	LATROBE GROUP	2	51.90					COAL,GREYISH-BLACK
72461 I	1530.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.68					MED OL GY FOSS V CALC SH
72461 I	1560.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.68					M OL GRY FOSS V CALC SH.
72461 K	1560.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.59					M.OL GY SLTY MOD CALC SH
72461 M	1590.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.46					LTOLGY SLTY MCALC.SH PYR
72447 F	1596.10	EOCENE-PALEOCENE	LATROBE GROUP	1	1.50					M.GRY%LT.GRY SLST. CARB.
72461 O	1620.00	EOCENE-PALEOCENE	LATROBE GROUP	2	53.80					GRY BLK COAL
72461 Q	1650.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.65					M GRY FOSS V CALC SH
72461 S	1680.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.61					M GRY FOSS MOD CALC SH
72447 I	1680.50	EOCENE-PALEOCENE	LATROBE GROUP	1	1.30					WH/LTOLGRY SLST.CLYSTLAM
72461 U	1710.00	EOCENE-PALEOCENE	LATROBE GROUP	2	57.80					BLK COAL
72447 E	1738.30	EOCENE-PALEOCENE	LATROBE GROUP	1	2.09					DK GRY SLTY SH,LAM.CARB.
72461 W	1740.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.46					LT OL GRY FOSS M CALC SH
72461 Y	1770.00	EOCENE-PALEOCENE	LATROBE GROUP	2	4.94					DK GRY SH. PYRITE
72462 A	1800.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.46					M OL GY FOSS V CALC SH.

Table 2 cont.

TOTAL ORGANIC CARBON REPORT

BASIN - GIPPSLAND
WELL - KAHAWAI 1

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	TOC%	AN	TOC%	AN	TOC%	DESCRIPTION
72462 C	1830.00	EOCENE-PALEOCENE	LATROBE GROUP	2	51.90					BLK COAL
72447 D	1856.50	EOCENE-PALEOCENE	LATROBE GROUP	1	2.01					DK GRY SLTY SH.MIC.CARB.
72462 E	1860.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.44					M OL GRY FOSS V CALC SH.
72462 G	1890.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.44					M OL GRY FOSS V CALC SH.
72462 I	1920.00	EOCENE-PALEOCENE	LATROBE GROUP	2	55.00					BLK COAL
72447 C	1932.70	EOCENE-PALEOCENE	LATROBE GROUP	1	3.91					GREYISH BLACK SHALE.
72462 K	1950.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.53					M OL GRY FOSS V CALC SH.
72462 M	1980.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.70					M OL GRY FOSS V CALC SH.
72462 O	2010.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.41					LT OL GRY FOSS V CALC SH
72462 Q	2040.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.69					M OL GRY FOSS M CALC SH.
72447 B	2053.00	EOCENE-PALEOCENE	LATROBE GROUP	1	1.79					M-DK GRY SH. CARB.MUDDY.
72462 S	2070.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.48					OL GRY FOSS M CALC.SH.
72462 U	2100.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.84					V LT OL GRY MOD CALC SH.
72462 W	2130.00	EOCENE-PALEOCENE	LATROBE GROUP	2	1.55					BR GRY COALY SH.
72462 Y	2160.00	EOCENE-PALEOCENE	LATROBE GROUP	2	2.24					LT OL SLTY SH.
72463 A	2190.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.64					M-LT GRY V CALC SH.
72463 C	2220.00	EOCENE-PALEOCENE	LATROBE GROUP	2	56.30					BLK COAL
72463 E	2250.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.99					M OL GRY COALY SLTY SH.
72463 G	2280.00	EOCENE-PALEOCENE	LATROBE GROUP	2	.93					OL GRY SANDY SH.
72447 A	2284.20	EOCENE-PALEOCENE	LATROBE GROUP	1	2.15					DK OLGRY,SLTY SH. CARB.
72363 I	2310.00	EOCENE-PALEOCENE	LATROBE GROUP	2	1.40					M OL GRY V CALC SH.

===> DEPTH : 1469.00 TO 2310.00 METRES. <=== I ===> AVERAGE TOC : 1.24 % EXCLUDING VALUES GREATER THAN 10.00 % <===

VITRINITE REFLECTANCE REPORT

Table 3.

BASIN - GIPPSLAND
WELL - KAHAWAI 1

SAMPLE NO.	DEPTH	AGE	FORMATION	AN	MAX. RO	FLUOR. COLOUR	NO.CNTS.	MACERAL TYPE
72451 X	1604.20	EOCENE-LATE CRET.	LATROBE GROUP	5	.48	YEL-OR	25	55-75%V,20-40%I,5-10%E
72451 L	1806.40	EOCENE-PALEOCENE	LATROBE GROUP	5	.36	YEL-OR	20	I>V>E,V COMMON
72447 T	2120.40	EOCENE-PALEOCENE	LATROBE GROUP	5	.49	YEL-OR	20	V,I COMMON,E SPARSE-COMM

Table 4.

KEROGEN ELEMENTAL ANALYSIS REPORT

BASIN - GIPPSLAND
WELL - KAHAWAI 1

SAMPLE NO.	DEPTH	SAMPLE TYPE	N%	C%	H%	S%	O%	ASH%	COMMENTS
			--- ELEMENTAL % (ASH FREE) ---						
72453 G	1424.60	KEROGEN	1.05	67.58	5.22	.00	26.15	3.81	
72452 H	1426.20	KEROGEN	1.10	68.78	5.45	.00	24.67	7.27	
72452 D	1572.20	KEROGEN	1.01	67.43	4.99	.00	26.58	9.13	
72451 Z	1577.60	KEROGEN	1.25	64.81	4.61	.00	29.34	7.94	
72447 F	1596.10	KEROGEN	1.04	71.19	4.99	.00	22.78	6.84	
72451 W	1611.20	KEROGEN	1.87	73.20	6.53	.00	18.40	10.00	HIGH ASH
72451 U	1639.80	KEROGEN	1.32	69.46	5.14	.00	24.08	8.56	
72451 T	1663.90	KEROGEN	1.35	65.15	4.62	.00	28.87	7.00	
72447 I	1680.50	KEROGEN	1.17	70.98	4.85	.00	23.00	7.97	
72451 R	1687.80	KEROGEN	1.19	70.42	5.04	.00	23.35	4.48	
72447 E	1738.30	KEROGEN	1.16	70.28	4.90	.00	23.66	14.57	HIGH ASH
72451 M	1791.30	KEROGEN	1.56	71.07	4.85	.00	22.52	5.98	
72451 L	1808.40	KEROGEN	1.27	71.55	4.69	.00	22.49	7.43	
72451 K	1820.00	KEROGEN	1.20	72.15	4.44	.00	22.21	4.70	
72451 I	1850.00	KEROGEN	1.16	80.40	4.21	.00	14.23	6.90	
72451 G	1895.60	KEROGEN	1.28	74.85	3.98	.00	19.89	3.86	
72447 C	1932.70	KEROGEN	1.11	67.61	4.99	.00	26.29	6.52	
72451 C	1960.30	KEROGEN	1.80	74.87	4.41	.00	18.91	5.25	
72451 B	1966.90	KEROGEN	1.35	75.75	4.07	.00	18.83	4.29	
72451 A	1997.60	KEROGEN	1.26	75.60	4.30	.00	18.83	4.05	
72447 Z	2005.10	KEROGEN	1.29	77.34	4.87	.00	16.50	3.45	
72447 X	2041.00	KEROGEN	1.18	79.01	3.51	.00	16.29	.98	
72447 W	2065.60	KEROGEN	1.07	74.80	6.43	.00	17.70	5.22	
72447 V	2084.00	KEROGEN	1.21	74.90	4.54	.00	19.36	6.39	
72447 U	2096.00	KEROGEN	1.39	77.28	4.54	.00	16.79	5.08	
72447 T	2120.40	KEROGEN	1.11	67.61	4.99	.00	26.29	6.52	
72447 S	2144.00	KEROGEN	1.07	67.89	4.53	.00	26.51	3.39	
72447 P	2191.60	KEROGEN	1.14	75.94	6.24	.00	16.68	13.91	HIGH ASH
72447 O	2220.40	KEROGEN	1.13	79.49	6.80	.00	12.58	3.81	
72447 N	2251.30	KEROGEN	1.26	81.09	5.60	.00	12.05	11.37	HIGH ASH
72447 M	2271.30	KEROGEN	1.44	80.09	4.19	.00	14.29	3.96	
72447 A	2284.20	KEROGEN	1.16	74.21	6.31	.00	18.32	5.81	
72447 L	2294.20	KEROGEN	1.57	80.59	5.14	.00	12.70	5.89	
72447 K	2307.50	KEROGEN	1.24	78.04	6.43	.00	14.29	3.96	

Table 5.

KEROGEN ELEMENTAL ANALYSIS REPORT

BASIN - GIPPSLAND
WELL - KAHAWAI 1

SAMPLE NO.	DEPTH	SAMPLE TYPE	AGE	FORMATION	ATOMIC RATIOS H/C	ATOMIC RATIOS O/C	ATOMIC RATIOS N/C	COMMENTS
72453 G	1424.60	KEROGEN	EOCENE-PALEOCENE.	LATROBE GROUP	.93	.29	.01	
72452 H	1426.20	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.95	.27	.01	
72452 D	1572.20	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.89	.30	.01	
72451 Z	1577.60	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.85	.34	.02	
72447 F	1596.10	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.84	.24	.01	
72451 W	1611.20	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	1.07	.19	.02	HIGH ASH
72451 U	1639.80	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.89	.26	.02	
72451 T	1663.90	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.85	.33	.02	
72447 I	1680.50	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.82	.24	.01	
72451 R	1687.80	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.86	.25	.01	
72447 E	1738.30	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.84	.25	.01	HIGH ASH
72451 M	1791.30	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.82	.24	.02	
72451 L	1808.40	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.79	.24	.02	
72451 K	1820.00	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.74	.23	.01	
72451 I	1850.00	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.63	.13	.01	
72451 G	1895.60	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.64	.20	.01	
72447 C	1932.70	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.88	.29	.01	
72451 C	1960.30	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.71	.19	.02	
72451 B	1966.90	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.65	.19	.02	
72451 A	1997.60	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.68	.19	.01	
72447 Z	2005.10	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.76	.16	.01	
72447 X	2041.00	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.53	.15	.01	
72447 W	2065.60	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	1.03	.18	.01	
72447 V	2084.00	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.73	.19	.01	
72447 U	2096.00	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.71	.16	.02	
72447 T	2120.40	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.88	.29	.01	
72447 S	2144.00	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.80	.29	.01	
72447 P	2191.60	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.99	.16	.01	HIGH ASH
72447 O	2220.40	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	1.03	.12	.01	
72447 N	2251.30	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.83	.11	.01	HIGH ASH
72447 M	2271.30	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.63	.13	.02	
72447 A	2284.20	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	1.02	.19	.01	
72447 L	2294.20	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.77	.12	.02	
72447 K	2307.50	KEROGEN	EOCENE-PALEOCENE	LATROBE GROUP	.99	.14	.01	

Table 6.

C_{15+} LIQUID CHROMATOGRAPHY DATA

DEPTH IN METRES	FORMATION/EQUIVALENT	AGE	TOTAL EXTRACT (ppm)	HC's (ppm)	NON HC's (ppm)	SULPHUR (ppm)	EXTRACT COMPOSITION% SATS	AROM.	N.S.O.	ASPH.	SULPHUR
1395-1410	Latrobe Group - Flounder GM.	Eocene - Late Cretaceous	218	-	-	-	-	-	-	67.4	-
1575-1590	Latrobe Group	Eocene - Late Cretaceous	1598	271	1327	-	4.3	12.7	27.0	56.1	-
1725-1740	Latrobe Group	Eocene - Late Cretaceous	1409	247	1163	-	4.8	12.7	27.9	54.6	-
1875-1890	Latrobe Group	Eocene - Late Cretaceous	1463	297	1166	-	4.5	15.8	28.7	51.0	-
2115-2130	Latrobe Group	Eocene - Late Cretaceous	2747	692	2005	-	9.3	15.9	17.6	57.1	-
2235-2250	Latrobe Group	Eocene - Late Cretaceous	4746	1270	3476	-	8.6	18.2	22.2	53.1	-

TABLE 7.

C4-C7 OIL 27 AUG 82

75852 AUSTRALIA, KAHAWAI-1, RFT-2 1403 M

	TOTAL PERCENT	NORM PERCENT		TOTAL PERCENT	NORM PERCENT
METHANE	0.000		CHEX	2.266	7.15
ETHANE	0.006		33-DMP	0.000	0.00
PROPANE	0.467		11-DMCP	0.224	0.71
IBUTANE	0.643	2.03	2-MHEX	1.104	3.48
NBUTANE	1.726	5.44	23-DMP	0.371	1.17
IPENTANE	1.994	6.29	3-MHEX	1.046	3.30
NPENTANE	2.538	8.00	1C3-DMCP	0.528	1.67
22-DMB	0.074	0.23	1T3-DMCP	0.475	1.50
CPENTANE	0.203	0.64	1T2-DMCP	0.801	2.53
23-DMB	0.281	0.88	3-EPENT	0.000	0.00
2-MP	1.727	5.45	224-TMP	0.000	0.00
3-MP	0.958	3.02	NHEPTANE	1.746	5.51
NHEXANE	2.788	8.79	1C2-DMCP	0.111	0.35
MCP	1.601	5.05	MCH	7.757	24.46
22-DMP	0.000	0.00	ECP	0.368	1.16
24-DMP	0.163	0.52	BENZENE	0.005	0.02
223-TMB	0.025	0.08	TOLUENE	0.191	0.60

TOTALS

ALL COMP	32.192
GASOLINE	31.718

SIG COMP RATIOS

C1/C2	3.23
A /D2	4.33
D1/D2	0.19
C1/D2	10.85
PENT/IPENT	1.27
CH/MCP	1.42

PARAFFIN INDEX 1	1.191
PARAFFIN INDEX 2	10.700

INTERPRETER - R.E. METTER
ANALYST - H.M. FRY

TABLE 8

KAHAWAI-1, CRUDE OIL: RFT-2, 1403m.

CHROMATOGRAPHY SUMMARY

SATURATE %	AROMATICS %	NSO %	SULPHUR %	ASPHALTENES %	NON ELUTED %
44.7	31.5	5.6	0.0	1.5	16.8

PE601338

This is an enclosure indicator page.
The enclosure PE601338 is enclosed within the container PE902654 at this location in this document.

The enclosure PE601338 has the following characteristics:

```
     ITEM_BARCODE = PE601338
CONTAINER_BARCODE = PE902654
             NAME = C1-4 Cuttings Gas Log
            BASIN = GIPPSLAND
           PERMIT =
             TYPE = WELL
          SUBTYPE = WELL_LOG
      DESCRIPTION = C1-4 Cuttings Gas Log (from WCR vol. 2)
                    for Kahawai-1
          REMARKS =
     DATE_CREATED =
    DATE_RECEIVED = 02/05/1983
             W_NO = W776
        WELL_NAME = Kahawi-1
       CONTRACTOR = ESSO
     CLIENT_OP_CO = ESSO
```

(Inserted by DNRE - Vic Govt Mines Dept)

PE603366

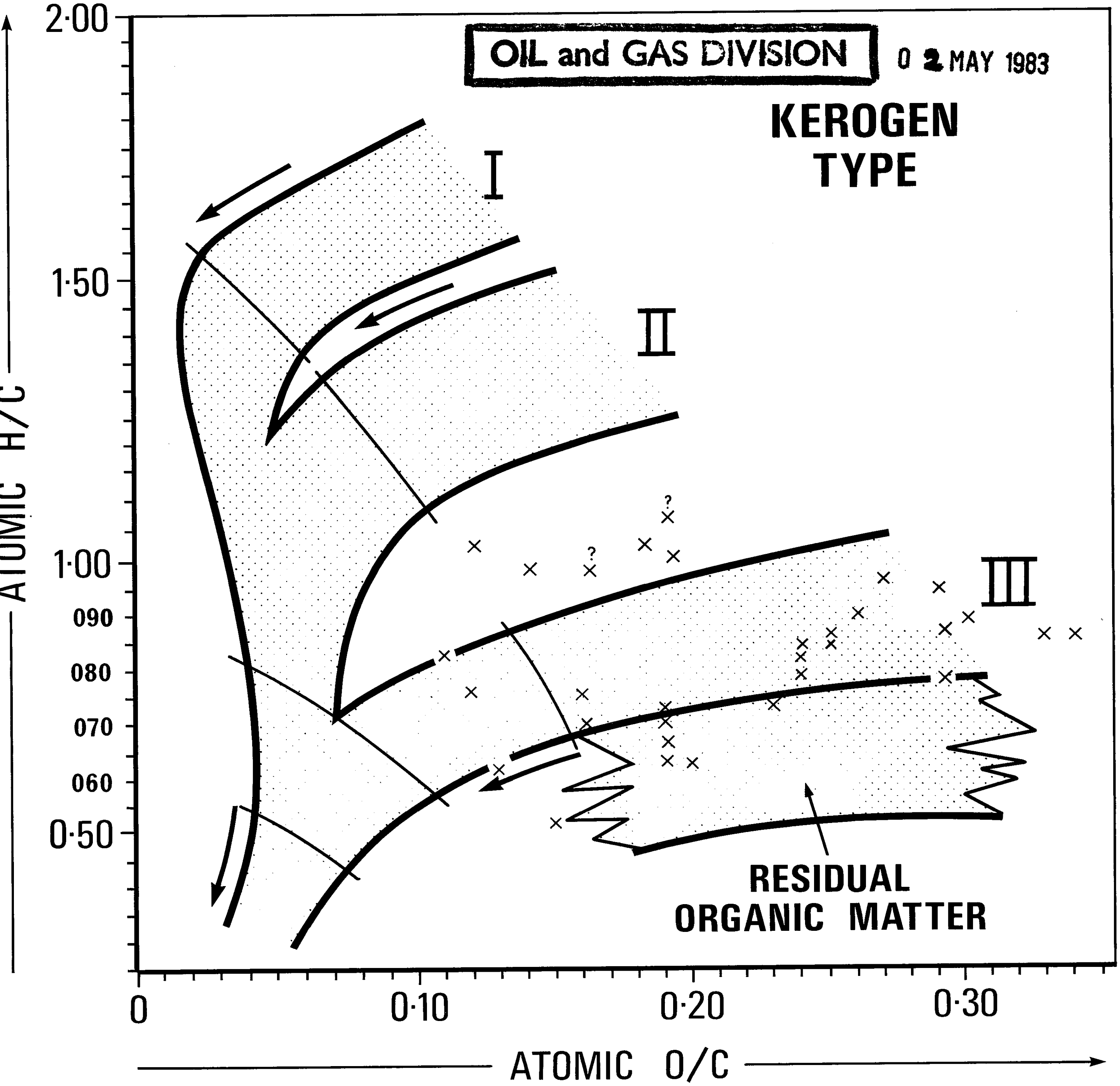
This is an enclosure indicator page.
The enclosure PE603366 is enclosed within the container PE902654 at this location in this document.

The enclosure PE603366 has the following characteristics:

```
     ITEM_BARCODE = PE603366
CONTAINER_BARCODE = PE902654
             NAME = Gas Geochemical Log
            BASIN = GIPPSLAND
           PERMIT = VIC/L4
             TYPE = WELL
          SUBTYPE = WELL_LOG
      DESCRIPTION = Geochemical log of cuttings C4-C7
                    analysis (ppb). Volume 2 of WCR.
          REMARKS =
     DATE_CREATED =
    DATE_RECEIVED = 02/05/1983
             W_NO = W776
        WELL_NAME = KAHAWAI-1
       CONTRACTOR =
     CLIENT_OP_CO = ESSO AUSTRALIA LIMITED
```

(Inserted by DNRE - Vic Govt Mines Dept)

KAHAWAI - 1

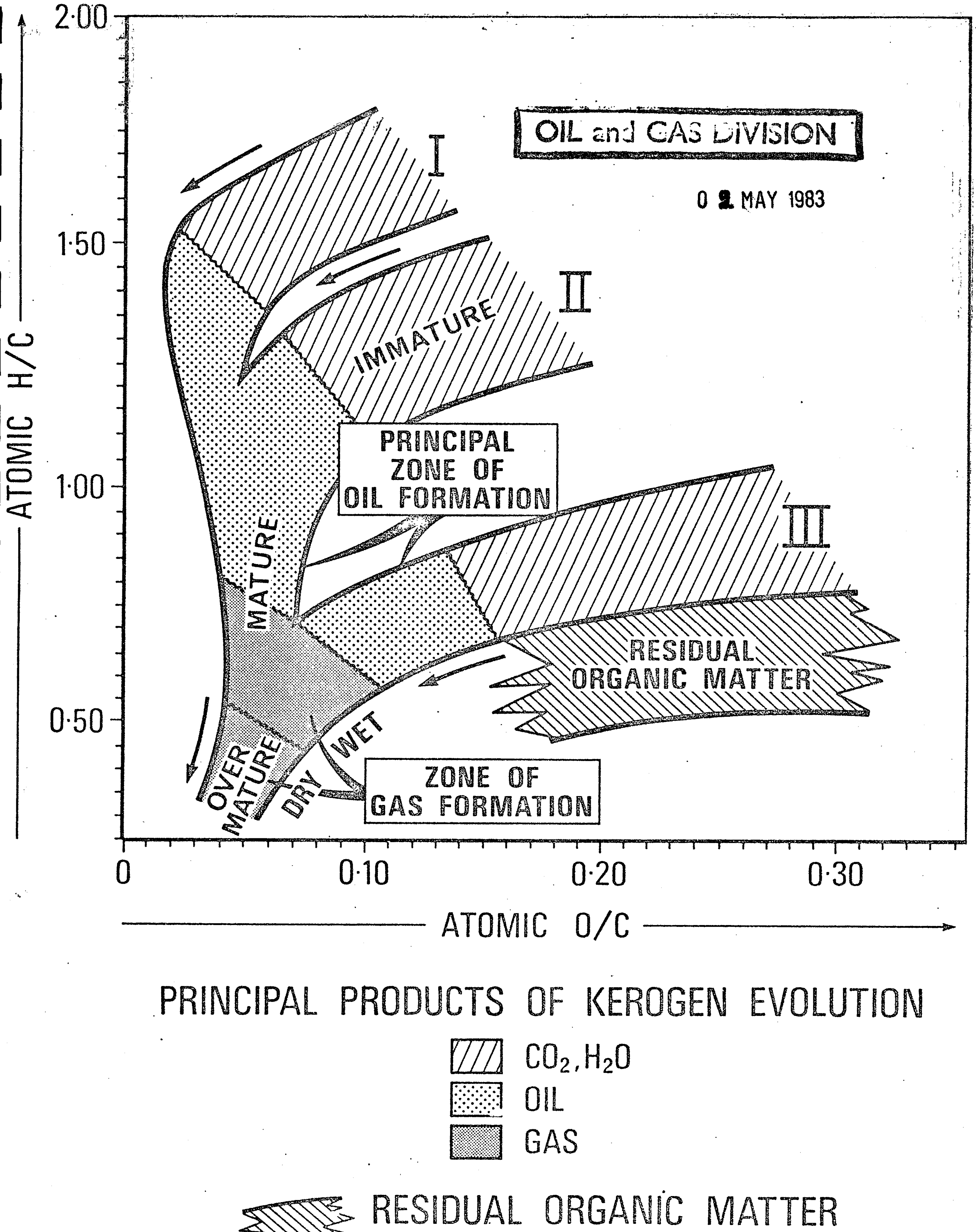


× LATROBE GROUP

1107/OP/235 Base

Dwg. 2096/OP/12

Fig. 4.



1380/BS/75

C_{15+} Paraffin-Naphthene Hydrocarbons

GeoChem Sample No. E532-001

Exxon Identification No. 72461-A

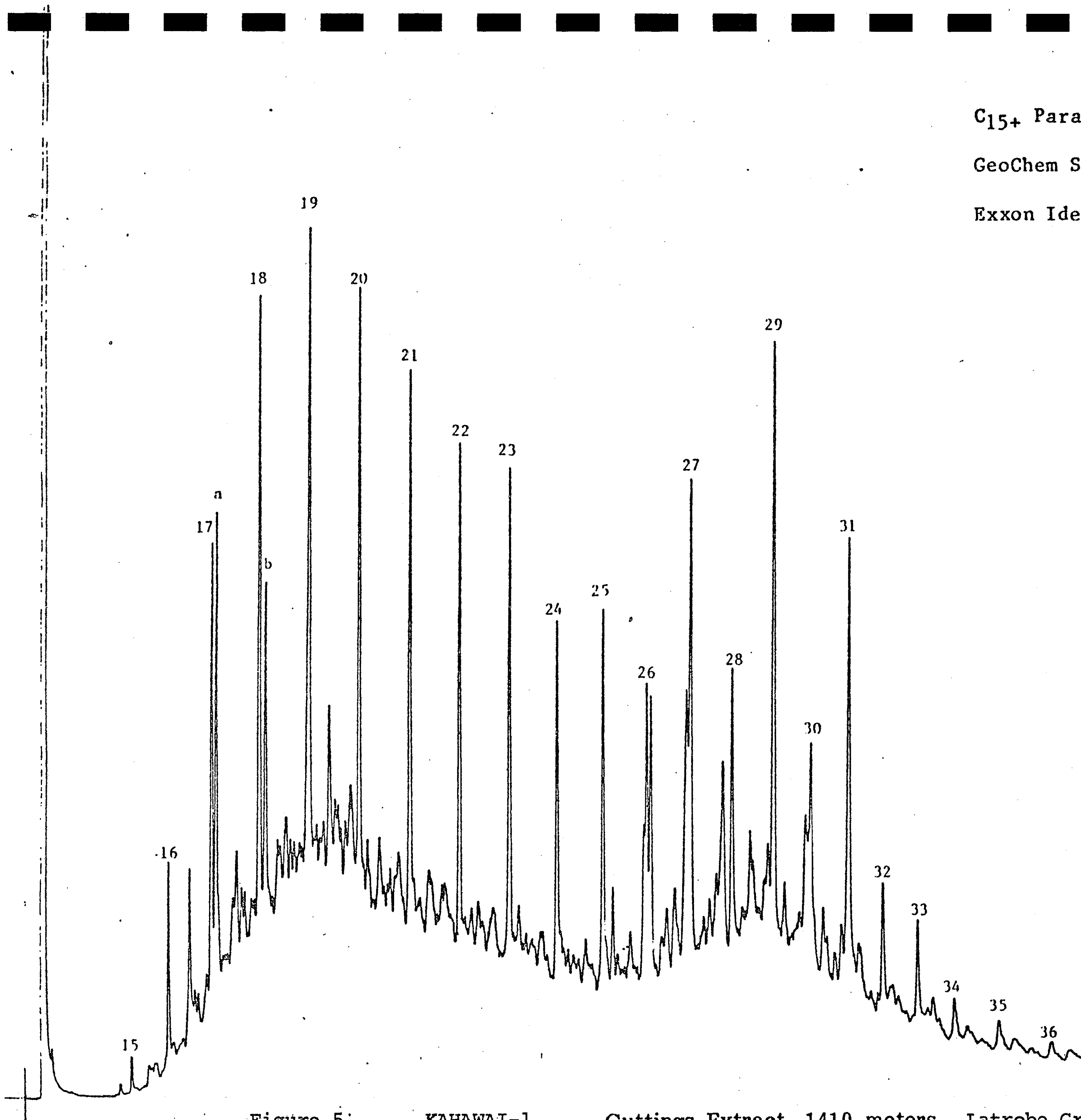


Figure 5; KAHAWAI-1 — Cuttings Extract, 1410 meters, Latrobe Group, Flounder FM.

C_{15+} Paraffin-Naphthene Hydrocarbons

GeoChem Sample No. E532-002

Exxon Identification No. 72461-M

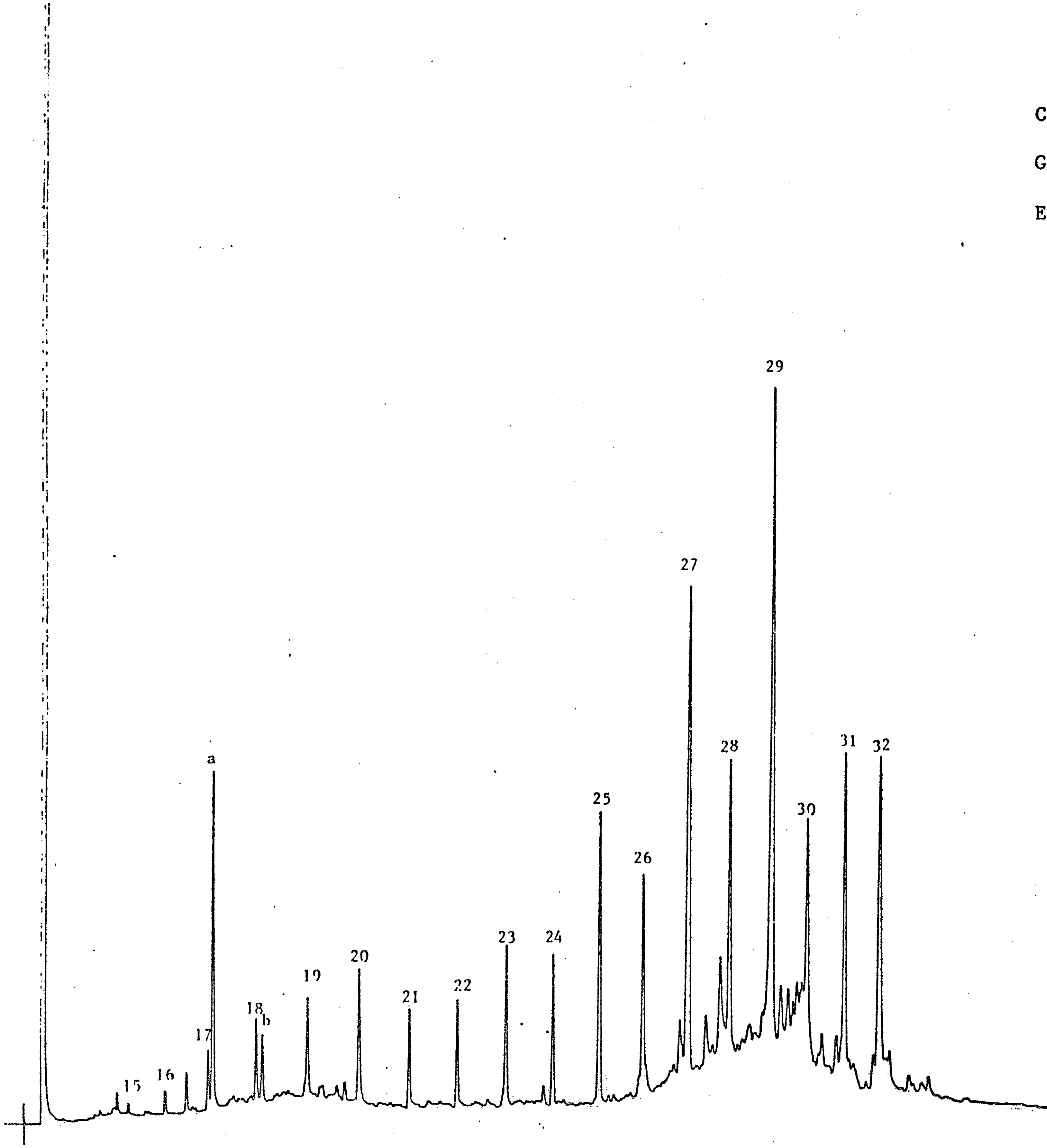


Figure 6; KAHAWAI-1 — Cuttings Extract, 1590 meters, Latrobe Group.

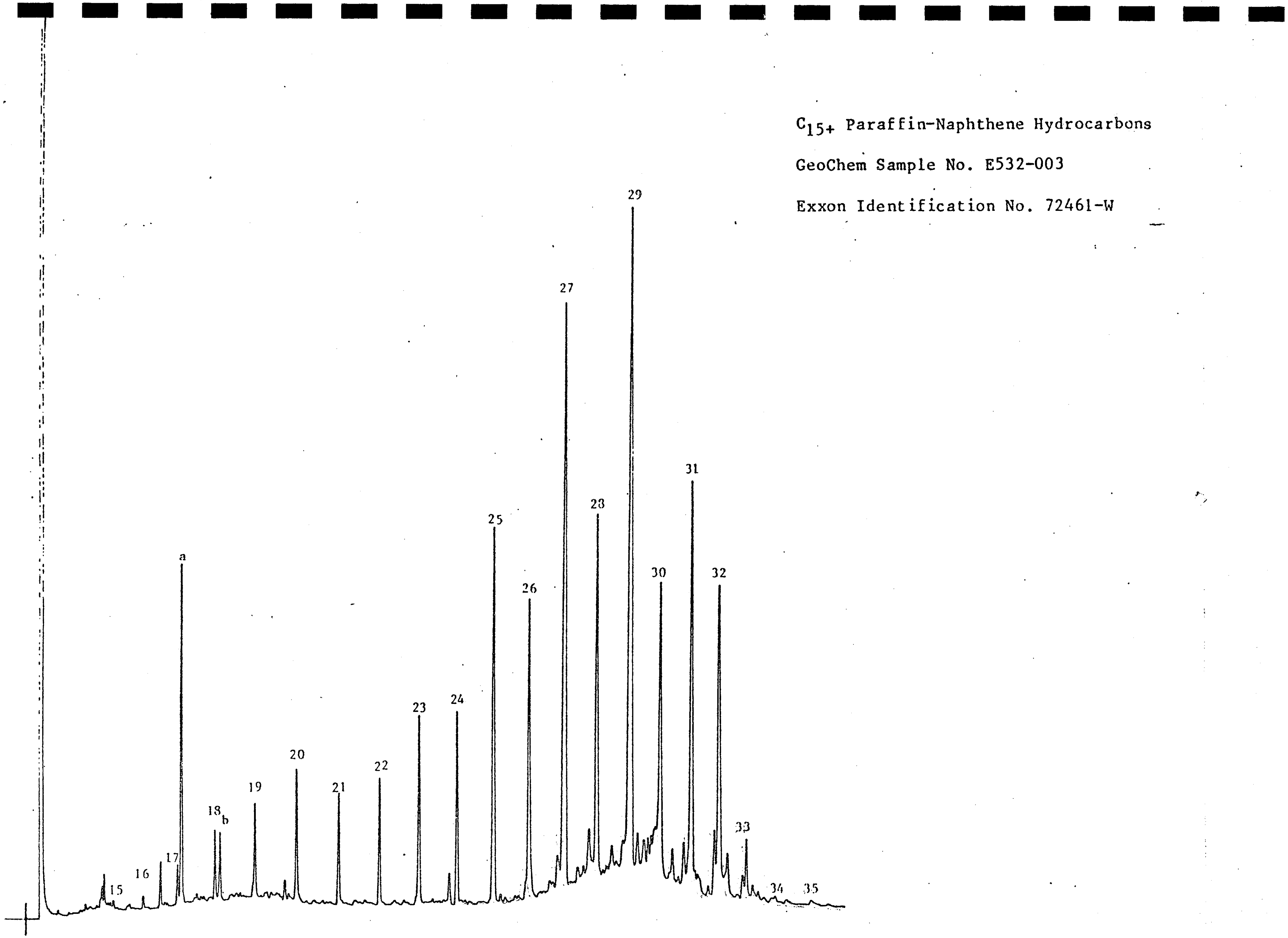


Figure 7, KAHAWAI-1 — Cuttings Extract, 1740 meters, Latrobe Group.

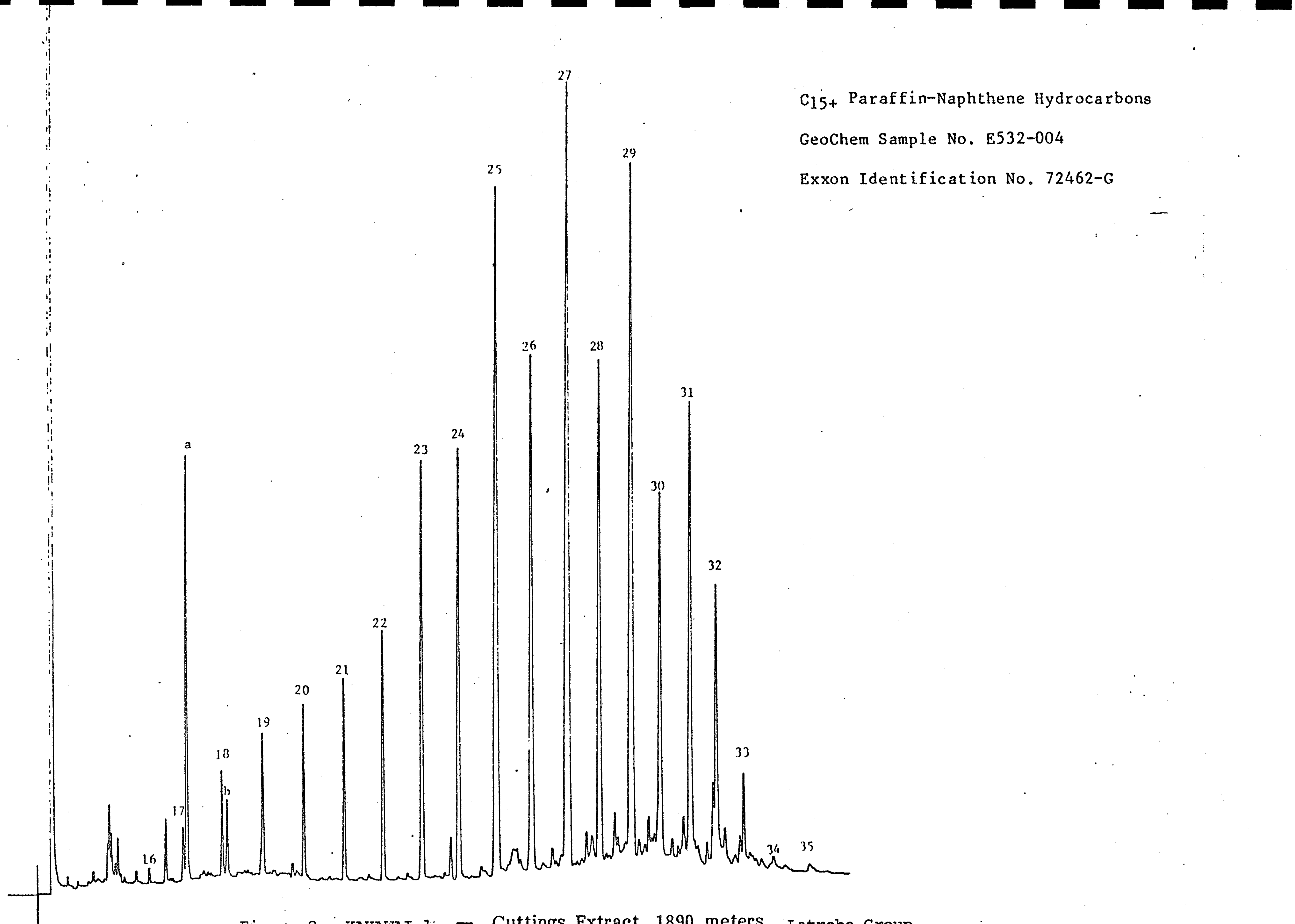


Figure 8, KAHAWAI-1 — Cuttings Extract, 1890 meters, Latrobe Group.

C_{15+} Paraffin-Naphthene Hydrocarbons

GeoChem Sample No. E532-005

Exxon Identification No. 72462-W

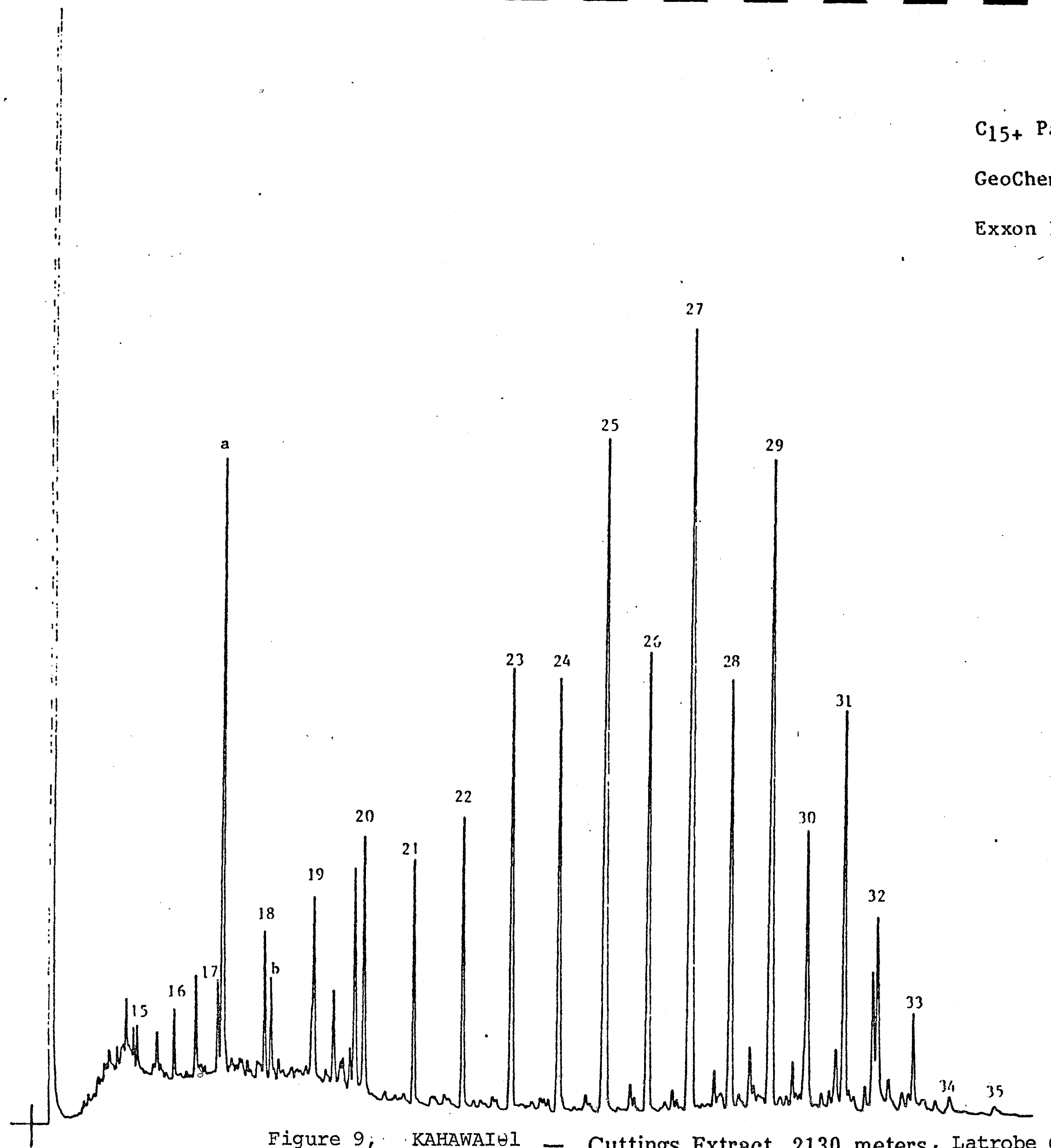
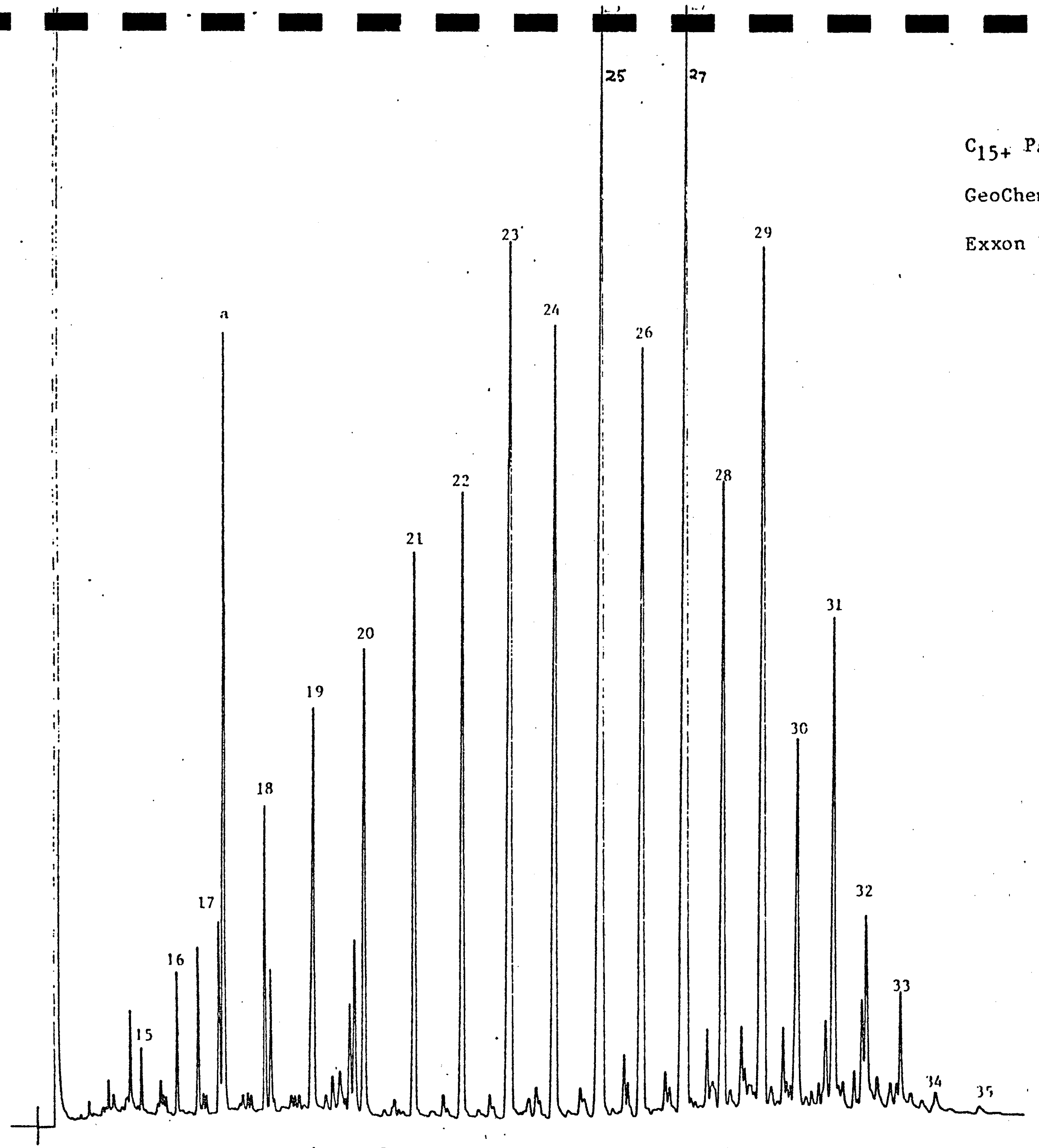


Figure 9, KAHAWAI-1 — Cuttings Extract, 2130 meters, Latrobe Group.



C15+ Paraffin-Naphthene Hydrocarbons

GeoChem Sample No. E532-006

Exxon Identification No. 72463-E

Figure 10, KAHAWAI-1 — Cuttings Extract, 2250 meters, Latrobe Group.

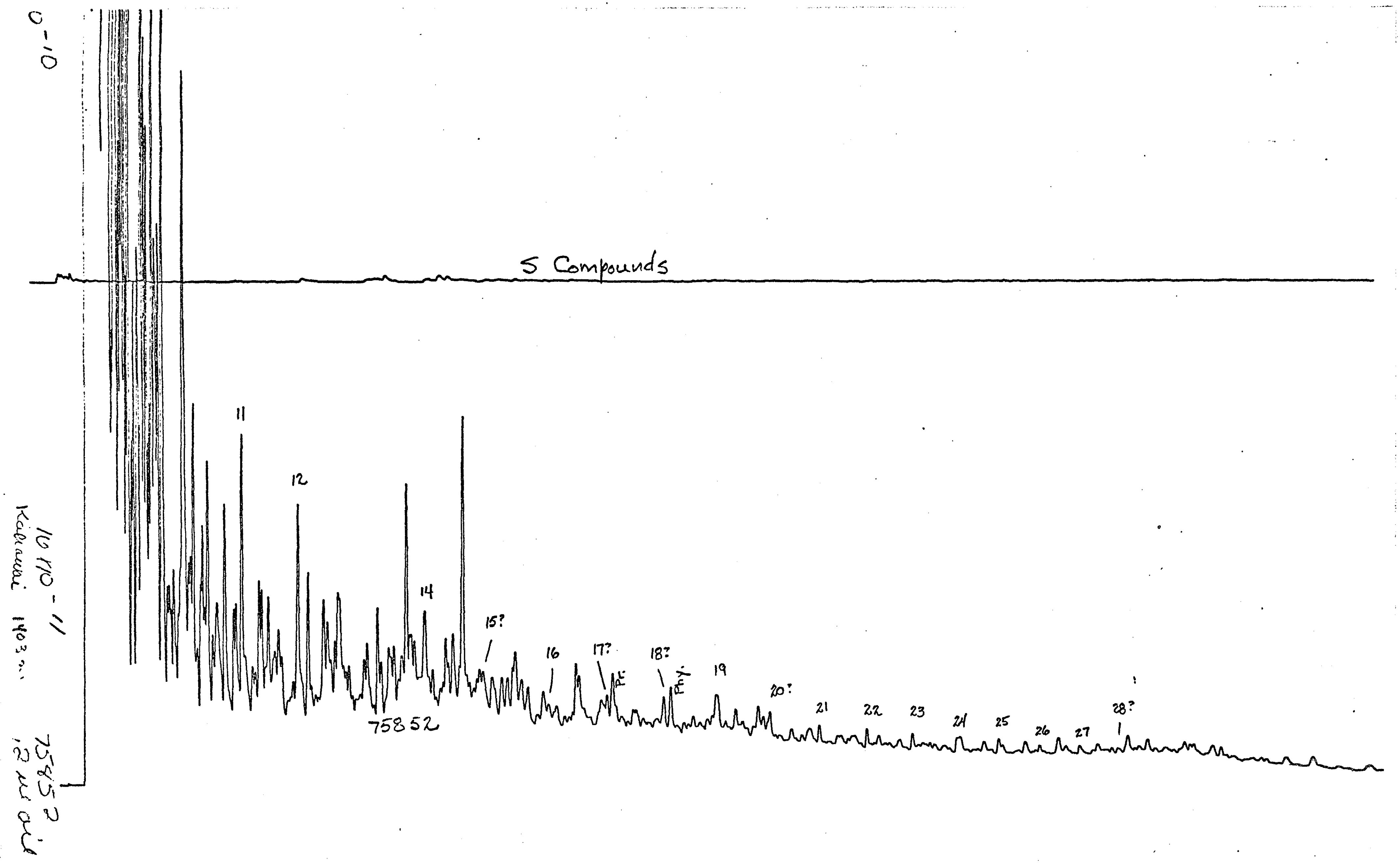


Figure 11, Whole Oil Chromatogram, Kahawai-1 oil sample, RFT-2, 1403m.

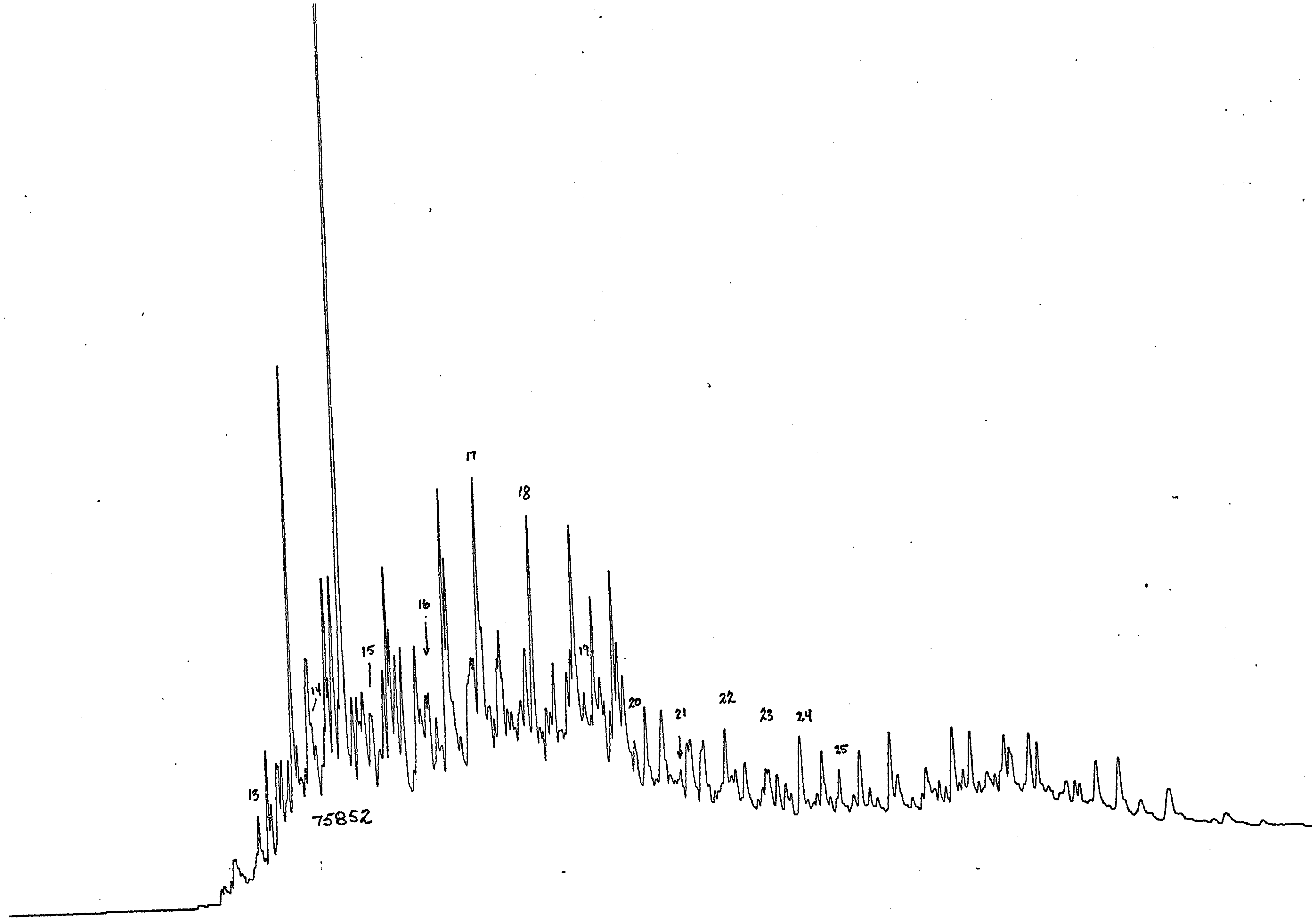


Figure 12: C_{15+} Chromatogram, Kahawai-1 oil, RFT-2, 1403m.

APPENDIX - 1

Detailed C_{4-7} Gasoline - Range Hydrocarbon

Data Sheets

APPENDIX - 1.

18 AUG 82

72460E AUSTRALIA, KAHAWAI-1 1085 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	42.1	2.50
NBUTANE	39.7	2.35
IPENTANE	384.3	22.79
NPENTANE	639.2	37.90
22-DMB	7.2	0.43
CPENTANE	24.7	1.46
23-DMB	5.8	0.34
2-MP	63.7	3.78
3-MP	5.0	0.30
NHEXANE	35.8	2.12
MCP	69.0	4.09
22-DMP	0.0	0.00
24-DMP	4.9	0.29
223-TMB	48.0	2.84
CHEXANE	92.9	5.51
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	19.3	1.14
23-DMP ,	9.5	0.56
3-MHEX ,	15.7	0.93
1C3-DMCP	15.3	0.91
1T3-DMCP	2.7	0.16
1T2-DMCP	16.0	0.95
3-EPENT	17.1	1.01
224-TMP	0.0	0.00
NHEPTANE	50.7	3.01
1C2-DMCP	6.3	0.37
MCH	71.6	4.25

	TOTALS PPB	NORM PERCENT
ALL COMP	1686.	
GASOLINE	1686.	
NAPHTHENES	299.	17.71
C6-7	475.	28.15

SIG COMP RATIOS

C1/C2	1.45
A /D2	5.52
C1/D2	11.74
CH/MCP	1.35
PENT/IPENT,	1.66

	PPB	NORM PERCENT
MCP	69.0	29.5
CH	92.9	39.8
MCH	71.6	30.7
TOTAL	233.5	100.0

PARAFFIN INDEX 1 1.027
PARAFFIN INDEX 2 16.310

18 AUG 82

72460G AUSTRALIA, KAHAWAI-1 1115 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	63.3	5.26
NBUTANE	72.3	6.00
IPENTANE	165.1	13.71
NPENTANE	213.4	17.72
22-DMB	4.4	0.37
CPENTANE	3.9	0.32
23-DMB	5.3	0.44
2-MP	59.4	4.93
3-MP	1.6	0.13
NHEXANE	31.2	2.59
MCP	57.0	4.73
22-DMP	0.0	0.00
24-DMP	7.5	0.62
223-TMB	50.1	4.16
CHEXANE	258.5	21.46
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	18.5	1.53
23-DMP ,	9.0	0.75
3-MHEX ,	15.4	1.28
1C3-DMCP	10.3	0.85
1T3-DMCP	2.4	0.20
1T2-DMCP	16.2	1.34
3-EPENT	15.8	1.31
224-TMP	0.0	0.00
NHEPTANE	49.7	4.13
1C2-DMCP	6.0	0.50
MCH	68.2	5.67

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	1205.		C1/C2	3.21
GASOLINE	1205.		A /D2	5.25
NAPHTHENES	422.	35.07	C1/D2	22.37
C6-7	616.	51.13	CH/MCP	4.53
			PENT/IPENT,	1.29

	PPB	NORM PERCENT
MCP	57.0	14.9
CH	258.5	67.4
MCH	68.2	17.8
TOTAL	383.7	100.0

PARAFFIN INDEX 1 1.174
PARAFFIN INDEX 2 10.711

724601 AUSTRALIA, KAHAWAI-1 1145 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	37.0	3.37
NBUTANE	23.6	2.15
IPENTANE	271.2	24.71
NPENTANE	218.5	19.91
22-DMB	1.3	0.12
CPENTANE	5.2	0.47
23-DMB	6.2	0.57
2-MP	60.9	5.55
3-MP	25.7	2.34
NHEXANE	45.5	4.15
MCP	6.8	0.62
22-DMP	0.0	0.00
24-DMP	55.0	5.01
223-TMB	2.7	0.25
CHEXANE	128.3	11.69
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	16.3	1.49
23-DMP ,	8.6	0.78
3-MHEX ,	14.1	1.28
1C3-DMCP	12.3	1.12
1T3-DMCP	11.9	1.09
1T2-DMCP	11.8	1.07
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	48.7	4.44
1C2-DMCP	4.6	0.42
MCH	81.2	7.40

	TOTALS PPB	NORM PERCENT
ALL COMP	1098.	
GASOLINE	1098.	
NAPHTHENES	262.	23.88
C6-7	448.	40.81

SIG COMP RATIOS	
C1/C2	4.76
A /D2	6.70
C1/D2	16.06
CH/MCP	18.76
PENT/IPENT,	0.81

	PPB	NORM PERCENT
MCP	6.8	3.2
CH	128.3	59.3
MCH	81.2	37.5
TOTAL	216.3	100.0

PARAFFIN INDEX 1 0.844
PARAFFIN INDEX 2 14.619

18 AUG 82

72460K AUSTRALIA, KAHAWAI-1 1175 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	40.4	3.38
NBUTANE	17.0	1.42
IPENTANE	265.6	22.20
NPENTANE	241.4	20.17
22-DMB	1.7	0.14
CPENTANE	5.9	0.50
23-DMB	7.1	0.60
2-MP	68.6	5.73
3-MP	24.8	2.07
NHEXANE	52.7	4.40
MCP	7.2	0.60
22-DMP	0.0	0.00
24-DMP	56.4	4.71
223-TMB	3.2	0.27
CHEXANE	168.7	14.10
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	17.6	1.47
23-DMP ,	12.1	1.01
3-MHEX ,	15.3	1.28
1C3-DMCP	15.4	1.29

	TOTAL PPB	NORM PERCENT
1T3-DMCP	16.6	1.38
1T2-DMCP	11.9	0.99
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	51.7	4.32
1C2-DMCP	5.5	0.46
MCH	89.9	7.51

	TOTALS PPB	NORM PERCENT
ALL COMP	1197.	
GASOLINE	1197.	
NAPHTHENES	321.	26.84
C6-7	524.	43.80

SIG COMP RATIOS

C1/C2	4.88
A /D2	6.83
C1/D2	18.08
CH/MCP	23.37
PENT/IPENT,	0.91

	PPB	NORM PERCENT
MCP	7.2	2.7
CH	168.7	63.5
MCH	89.9	33.8
TOTAL	265.8	100.0

PARAFFIN INDEX 1	0.750
PARAFFIN INDEX 2	12.948

18 AUG 82

72460M AUSTRALIA, KAHAWAI-1 1205 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	11.3	1.92
NBUTANE	13.9	2.36
IPENTANE	113.3	19.22
NPENTANE	45.4	7.71
22-DMB	1.7	0.30
CPENTANE	4.5	0.76
23-DMB	5.1	0.86
2-MP	46.4	7.87
3-MP	20.9	3.54
NHEXANE	37.2	6.30
MCP	6.9	1.17
22-DMP	0.0	0.00
24-DMP	38.9	6.60
223-TMB	2.1	0.35
CHEXANE	84.3	14.29
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	13.1	2.23
23-DMP ,	8.8	1.50
3-MHEX ,	10.2	1.73
1C3-DMCP	9.7	1.65

	TOTAL PPB	NORM PERCENT
1T3-DMCP	9.8	1.66
1T2-DMCP	8.9	1.51
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	37.8	6.41
1C2-DMCP	0.0	0.00
MCH	59.4	10.07

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	590.		C1/C2	4.44
GASOLINE	590.		A /D2	7.36
NAPHTHENES	184.	31.11	C1/D2	15.40
C6-7	327.	55.46	CH/MCP	12.19
			PENT/IPENT,	0.40

	PPB	NORM PERCENT
MCP	6.9	4.6
CH	84.3	56.0
MCH	59.4	39.4
TOTAL	150.6	100.0

PARAFFIN INDEX 1 0.821
PARAFFIN INDEX 2 15.605

18 AUG 82

724600 AUSTRALIA, KAHAWAI-1 1235 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	17.9	2.43
NBUTANE	15.0	2.04
IPENTANE	145.7	19.79
NPENTANE	44.2	6.01
22-DMB	0.4	0.05
CPENTANE	6.2	0.85
23-DMB	6.5	0.88
2-MP	61.0	8.28
3-MP	23.3	3.16
NHEXANE	48.9	6.64
MCP	4.9	0.67
22-DMP	0.0	0.00
24-DMP	45.4	6.16
223-TMB	3.4	0.46
CHEXANE	89.5	12.16
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	17.4	2.36
23-DMP ,	9.1	1.24
3-MHEX ,	11.2	1.53
1C3-DMCP	16.0	2.18
1T3-DMCP	16.1	2.19
1T2-DMCP	13.8	1.88
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	53.6	7.28
1C2-DMCP	5.0	0.68
MCH	81.5	11.08

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	736.		C1/C2	3.37
GASOLINE	736.		A /D2	9.11
NAPHTHENES	233.	31.68	C1/D2	16.76
C6-7	416.	56.51	CH/MCP	18.12
			PENT/IPENT,	0.30

	PPB	NORM PERCENT
MCP	4.9	2.8
CH	89.5	50.9
MCH	81.5	46.3
TOTAL	175.9	100.0

PARAFFIN INDEX 1 0.623
PARAFFIN INDEX 2 17.377

18 AUG 82

72460Q AUSTRALIA, KAHAWAI-1 1265 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	44.0	4.92
NBUTANE	15.4	1.72
IPENTANE	177.5	19.83
NPENTANE	60.0	6.70
22-DMB	3.3	0.37
CPENTANE	5.7	0.64
23-DMB	6.6	0.74
2-MP	64.8	7.24
3-MP	25.5	2.85
NHEXANE	54.8	6.12
MCP	9.9	1.10
22-DMP	0.0	0.00
24-DMP	52.0	5.81
223-TMB	2.3	0.25
CHEXANE	137.2	15.33
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	20.4	2.28
23-DMP ,	11.0	1.23
3-MHEX ,	15.0	1.68
1C3-DMCP	16.0	1.78

	TOTAL PPB	NORM PERCENT
1T3-DMCP	14.4	1.61
1T2-DMCP	15.0	1.67
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	54.0	6.04
1C2-DMCP	5.2	0.58
MCH	85.0	9.50

	TOTALS PPB	NORM PERCENT
ALL COMP	895.	
GASOLINE	895.	
NAPHTHENES	288.	32.21
C6-7	492.	54.99

SIG COMP RATIOS

C1/C2	4.02
A /D2	7.23
C1/D2	16.13
CH/MCP	13.88
PENT/IPENT,	0.34

	PPB	NORM PERCENT
MCP	9.9	4.3
CH	137.2	59.1
MCH	85.0	36.6
TOTAL	232.1	100.0

PARAFFIN INDEX 1 0.782
PARAFFIN INDEX 2 14.679

18 AUG 82

72460S AUSTRALIA, KAHAWAI-1 1295 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	69.2	8.10
NBUTANE	20.7	2.42
IPENTANE	153.7	17.98
NPENTANE	122.4	14.33
22-DMB	0.7	0.08
CPENTANE	6.1	0.71
23-DMB	5.1	0.60
2-MP	52.0	6.08
3-MP	20.7	2.43
NHEXANE	52.9	6.19
MCP	10.1	1.18
22-DMP	0.0	0.00
24-DMP	35.4	4.14
223-TMB	1.3	0.15
CHEXANE	110.6	12.94
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	18.0	2.11
23-DMP ,	11.2	1.31
3-MHEX ,	12.2	1.43
1C3-DMCP	8.2	0.96

	TOTAL PPB	NORM PERCENT
1T3-DMCP	8.0	0.93
1T2-DMCP	9.0	1.06
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	59.4	6.94
1C2-DMCP	0.0	0.00
MCH	67.8	7.93

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	855.		C1/C2	5.56
GASOLINE	855.		A /D2	9.17
NAPHTHENES	220.	25.72	C1/D2	16.05
C6-7	404.	47.28	CH/MCP	10.94
			PENT/IPENT,	0.80

	PPB	NORM PERCENT
MCP	10.1	5.4
CH	110.6	58.7
MCH	67.8	36.0
TOTAL	188.5	100.0

PARAFFIN INDEX 1 1.199
PARAFFIN INDEX 2 19.499

18 AUG 82

72460U AUSTRALIA, KAHAWAI-1 1325 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	52.6	20.53
NPENTANE	85.9	33.52
22-DMB	0.0	0.00
CPENTANE	0.0	0.00
23-DMB	1.3	0.50
2-MP	22.1	8.63
3-MP	10.3	4.00
NHEXANE	23.3	9.08
MCP	9.9	3.86
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	0.0	0.00
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	0.0	0.00
23-DMP ,	6.2	2.40
3-MHEX ,	3.8	1.48
1C3-DMCP	0.0	0.00

	TOTAL PPB	NORM PERCENT
1T3-DMCP	0.0	0.00
1T2-DMCP	0.0	0.00
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	23.9	9.31
1C2-DMCP	0.0	0.00
MCH	17.1	6.67

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	256.		C1/C2	1.73
GASOLINE	256.		A /D2	12.40
NAPHTHENES	27.	10.53	C1/D2	4.50
C6-7	84.	32.81	CH/MCP	0.00
			PENT/IPENT,	1.63

	PPB	NORM PERCENT
MCP	9.9	36.6
CH	0.0	0.0
MCH	17.1	63.4
TOTAL	27.0	100.0

PARAFFIN INDEX 1 0.000
PARAFFIN INDEX 2 46.866

18 AUG 82

72460W AUSTRALIA, KAHAWAI-1 1355 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	8.7	2.59
NBUTANE	34.0	10.19
IPENTANE	49.4	14.79
NPENTANE	111.0	33.21
22-DMB	0.8	0.25
CPENTANE	3.6	1.09
23-DMB	2.9	0.86
2-MP	21.2	6.35
3-MP	8.7	2.59
NHEXANE	24.0	7.19
MCP	10.3	3.07
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	5.6	1.68
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	5.7	1.71
23-DMP ,	1.7	0.50
3-MHEX ,	4.7	1.41
1C3-DMCP	0.0	0.00

	TOTAL PPB	NORM PERCENT
1T3-DMCP	0.0	0.00
1T2-DMCP	0.0	0.00
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	27.0	8.08
1C2-DMCP	0.0	0.00
MCH	14.8	4.44

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	334.		C1/C2	2.55
GASOLINE	334.		A /D2	10.82
NAPHTHENES	34.	10.28	C1/D2	5.55
C6-7	94.	28.07	CH/MCP	0.55
			PENT/IPENT,	2.25

	PPB	NORM PERCENT
MCP	10.3	33.4
CH	5.6	18.3
MCH	14.8	48.3
TOTAL	30.7	100.0

PARAFFIN INDEX 1 0.000
PARAFFIN INDEX 2 45.372

18 AUG 82

72460Y AUSTRALIA, KAHAWAI-1 1385 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	20.9	12.30
NBUTANE	39.4	23.21
IPENTANE	3.5	2.06
NPENTANE	22.3	13.10
22-DMB	0.0	0.00
CPENTANE	0.0	0.00
23-DMB	1.1	0.67
2-MP	15.4	9.08
3-MP	8.1	4.79
NHEXANE	18.3	10.78
MCP	0.0	0.00
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	7.7	4.52
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	0.0	0.00
23-DMP ,	0.0	0.00
3-MHEX ,	0.0	0.00
1C3-DMCP	0.0	0.00

	TOTAL PPB	NORM PERCENT
1T3-DMCP	0.0	0.00
1T2-DMCP	0.0	0.00
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	16.4	9.66
1C2-DMCP	0.0	0.00
MCH	16.7	9.84

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	170.		C1/C2	999.99
GASOLINE	170.		A /D2	999.99
NAPHTHENES	24.	14.36	C1/D2	999.99
C6-7	59.	34.79	CH/MCP	999.99
			PENT/IPENT,	6.37

	PPB	NORM PERCENT
MCP	0.0	0.0
CH	7.7	31.5
MCH	16.7	68.5
TOTAL	24.4	100.0

PARAFFIN INDEX 1 0.000
PARAFFIN INDEX 2 40.220

18 AUG 82

72461A AUSTRALIA, KAHAWAI-1 1410 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	32.6	0.74
NBUTANE	18.1	0.41
IPENTANE	140.3	3.20
NPENTANE	389.5	8.88
22-DMB	6.9	0.16
CPENTANE	13.0	0.30
23-DMB	34.5	0.79
2-MP	287.8	6.56
3-MP	159.1	3.63
NHEXANE	536.6	12.23
MCP	298.1	6.79
22-DMP	0.0	0.00
24-DMP	10.3	0.24
223-TMB	0.0	0.00
CHEXANE	365.3	8.33
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	112.4	2.56
23-DMP ,	60.4	1.38
3-MHEX ,	108.3	2.47
1C3-DMCP	70.7	1.61

	TOTAL PPB	NORM PERCENT
1T3-DMCP	87.6	2.00
1T2-DMCP	91.8	2.09
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	176.0	4.01
1C2-DMCP	12.4	0.28
MCH	1375.0	31.34

	TOTALS PPB	NORM PERCENT
ALL COMP	4387.	
GASOLINE	4387.	
NAPHTHENES	2314.	52.75
C6-7	3305.	75.34

SIG COMP RATIOS	
C1/C2	3.31
A /D2	6.58
C1/D2	17.11
CH/MCP	1.23
PENT/IPENT,	2.78

	PPB	NORM PERCENT
MCP	298.1	14.6
CH	365.3	17.9
MCH	1375.0	67.5
TOTAL	2038.4	100.0

PARAFFIN INDEX 1 0.882
PARAFFIN INDEX 2 7.191

18 AUG 82

72461C AUSTRALIA, KAHAWAI-1 1440 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	35.2	2.25
NBUTANE	17.9	1.14
IPENTANE	102.8	6.58
NPENTANE	236.7	15.15
22-DMB	3.9	0.25
CPENTANE	10.6	0.68
23-DMB	11.9	0.76
2-MP	92.3	5.91
3-MP	50.9	3.26
NHEXANE	148.7	9.52
MCP	107.9	6.91
22-DMP	0.0	0.00
24-DMP	1.7	0.11
223-TMB	0.0	0.00
CHEXANE	156.6	10.03
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	24.1	1.54
23-DMP ,	16.9	1.09
3-MHEX ,	23.3	1.49
1C3-DMCP	20.4	1.31

	TOTAL PPB	NORM PERCENT
1T3-DMCP	21.4	1.37
1T2-DMCP	26.8	1.72
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	51.3	3.28
1C2-DMCP	0.0	0.00
MCH	400.1	25.62

	TOTALS PPB	NORM PERCENT
ALL COMP	1562.	
GASOLINE	1562.	
NAPHTHENES	744.	47.64
C6-7	999.	64.00

SIG COMP RATIOS	
C1/C2	3.29
A /D2	8.57
C1/D2	24.90
CH/MCP	1.45
PENT/IPENT,	2.30

	PPB	NORM PERCENT
MCP	107.9	16.2
CH	156.6	23.6
MCH	400.1	60.2
TOTAL	664.6	100.0

PARAFFIN INDEX 1 0.691
PARAFFIN INDEX 2 6.923

18 AUG 82

72461E AUSTRALIA, KAHAWAI-1 1470 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	20.1	6.60
NPENTANE	10.4	3.42
22-DMB	0.0	0.00
CPENTANE	2.2	0.72
23-DMB	2.7	0.90
2-MP	22.8	7.50
3-MP	14.0	4.60
NHEXANE	36.4	11.97
MCP	24.9	8.20
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	23.9	7.87
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	7.3	2.40
23-DMP ,	2.7	0.90
3-MHEX ,	7.3	2.40
1C3-DMCP	4.1	1.35

	TOTAL PPB	NORM PERCENT
1T3-DMCP	3.7	1.22
1T2-DMCP	5.1	1.67
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	20.6	6.77
1C2-DMCP	0.0	0.00
MCH	95.8	31.49

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	304.		C1/C2	3.36
GASOLINE	304.		A /D2	7.81
NAPHTHENES	160.	52.54	C1/D2	17.41
C6-7	232.	76.26	CH/MCP	0.96
			PENT/IPENT,	0.52

	PPB	NORM PERCENT
MCP	24.9	17.2
CH	23.9	16.6
MCH	95.8	66.2
TOTAL	144.6	100.0

PARAFFIN INDEX 1 1.129
PARAFFIN INDEX 2 12.077

18 AUG 82

72461G AUSTRALIA, KAHAWAI-1 1500 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	1087.5	6.85
NBUTANE	1087.2	6.85
IPENTANE	1186.1	7.47
NPENTANE	782.0	4.93
22-DMB	91.7	0.58
CPENTANE	197.6	1.25
23-DMB	249.7	1.57
2-MP	627.3	3.95
3-MP	300.3	1.89
NHEXANE	334.2	2.11
MCP	2125.0	13.39
22-DMP	0.0	0.00
24-DMP	55.5	0.35
223-TMB	19.8	0.12
CHEXANE	565.8	3.57
33-DMP	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX	109.9	0.69
23-DMP	279.1	1.76
3-MHEX	201.8	1.27
1C3-DMCP	1114.8	7.02

	TOTAL PPB	NORM PERCENT
1T3-DMCP	1208.6	7.62
1T2-DMCP	1274.2	8.03
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	285.0	1.80
1C2-DMCP	478.5	3.01
MCH	2209.6	13.92

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	15871.		C1/C2	0.47
GASOLINE	15871.		A /D2	3.07
NAPHTHENES	9174.	57.80	C1/D2	14.30
C6-7	10262.	64.66	CH/MCP	0.27
			PENT/IPENT,	0.66

	PPB	NORM PERCENT
MCP	2125.0	43.4
CH	565.8	11.5
MCH	2209.6	45.1
TOTAL	4900.4	100.0

PARAFFIN INDEX 1 0.087
PARAFFIN INDEX 2 3.932

18 AUG 82

72461I AUSTRALIA, KAHAWAI-1 1530 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	8.3	6.34
NPENTANE	26.7	20.43
22-DMB	1.4	1.11
CPENTANE	0.0	0.00
23-DMB	0.7	0.52
2-MP	7.8	5.94
3-MP	9.0	6.93
NHEXANE	13.6	10.42
MCP	14.4	11.06
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	3.4	2.62
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	0.0	0.00
23-DMP ,	0.0	0.00
3-MHEX ,	0.0	0.00
1C3-DMCP	0.0	0.00

	TOTAL PPB	NORM PERCENT
1T3-DMCP	2.2	1.69
1T2-DMCP	9.6	7.33
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	15.0	11.47
1C2-DMCP	0.0	0.00
MCH	18.5	14.14

	TOTALS PPB	NORM PERCENT
ALL COMP	131.	
GASOLINE	131.	
NAPHTHENES	48.	36.85
C6-7	77.	58.73

SIG COMP RATIOS

C1/C2	0.83
A /D2	999.99
C1/D2	999.99
CH/MCP	0.24
PENT/IPENT,	3.22

	PPB	NORM PERCENT
MCP	14.4	39.7
CH	3.4	9.4
MCH	18.5	50.8
TOTAL	36.3	100.0

PARAFFIN INDEX 1 0.000
PARAFFIN INDEX 2 30.774

18 AUG 82

72461K AUSTRALIA, KAHAWAI-1 1560 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	17.8	5.17
NPENTANE	24.3	7.07
22-DMB	1.6	0.46
CPENTANE	0.7	0.20
23-DMB	4.3	1.26
2-MP	30.3	8.82
3-MP	19.1	5.55
NHEXANE	44.2	12.86
MCP	35.9	10.43
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	14.7	4.29
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	6.2	1.81
23-DMP ,	3.5	1.02
3-MHEX ,	6.1	1.77
1C3-DMCP	0.0	0.00

	TOTAL PPB	NORM PERCENT
1T3-DMCP	6.8	1.97
1T2-DMCP	22.6	6.56
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	24.5	7.12
1C2-DMCP	0.0	0.00
MCH	81.2	23.63

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	344.		C1/C2	1.57
GASOLINE	344.		A /D2	11.30
NAPHTHENES	162.	47.08	C1/D2	16.81
C6-7	246.	71.46	CH/MCP	0.41
			PENT/IPENT,	1.37

	PPB	NORM PERCENT
MCP	35.9	27.2
CH	14.7	11.2
MCH	81.2	61.6
TOTAL	131.8	100.0

PARAFFIN INDEX 1 0.420
PARAFFIN INDEX 2 14 785

18 AUG 82

72461M AUSTRALIA, KAHAWAI-1 1590 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	20.4	7.68
NPENTANE	23.7	8.91
22-DMB	0.0	0.00
CPENTANE	2.2	0.83
23-DMB	1.7	0.66
2-MP	14.6	5.48
3-MP	9.2	3.45
NHEXANE	14.3	5.37
MCP	4.9	1.86
22-DMP	0.0	0.00
24-DMP	37.2	13.99
223-TMB	0.0	0.00
CHEXANE	5.7	2.14
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	3.7	1.40
23-DMP ,	2.7	1.03
3-MHEX ,	5.2	1.94
1C3-DMCP	13.8	5.20

	TOTAL PPB	NORM PERCENT
1T3-DMCP	10.8	4.05
1T2-DMCP	28.9	10.85
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	20.6	7.74
1C2-DMCP	0.0	0.00
MCH	46.4	17.44

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	266.		C1/C2	0.96
GASOLINE	266.		A /D2	6.75
NAPHTHENES	113.	42.36	C1/D2	10.81
C6-7	194.	72.99	CH/MCP	1.15
			PENT/IPENT,	1.16

	PPB	NORM PERCENT
MCP	4.9	8.7
CH	5.7	10.0
MCH	46.4	81.4
TOTAL	57.0	100.0

PARAFFIN INDEX 1 0.166
PARAFFIN INDEX 2 14.943

18 AUG 82

724610 AUSTRALIA, KAHAWAI-1 1620 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	3087.7	4.36
NBUTANE	1782.0	2.52
IPENTANE	6782.9	9.58
NPENTANE	1756.7	2.48
22-DMB	14.7	0.02
CPENTANE	913.7	1.29
23-DMB	806.2	1.14
2-MP	3602.9	5.09
3-MP	1584.9	2.24
NHEXANE	1559.2	2.20
MCP	15909.2	22.46
22-DMP	0.0	0.00
24-DMP	44.7	0.06
223-TMB	10.9	0.02
CHEXANE	801.7	1.13
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	364.5	0.51
23-DMP ,	955.3	1.35
3-MHEX ,	667.5	0.94
1C3-DMCP	4316.6	6.09
1T3-DMCP	2810.6	3.97
1T2-DMCP	9665.9	13.65
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	2037.2	2.88
1C2-DMCP	2639.9	3.73
MCH	8716.4	12.31

	TOTALS PPB	NORM PERCENT
ALL COMP	70831.	
GASOLINE	70831.	
NAPHTHENES	45774.	64.62
C6-7	50500.	71.30

SIG COMP RATIOS	
C1/C2	0.28
A /D2	5.39
C1/D2	14.81
CH/MCP	0.05
PENT/IPENT,	0.26

	PPB	NORM PERCENT
MCP	15909.2	62.6
CH	801.7	3.2
MCH	8716.4	34.3
TOTAL	25427.3	100.0

PARAFFIN INDEX 1 0.061
PARAFFIN INDEX 2 6.715

18 AUG 82

72461Q AUSTRALIA, KAHAWAI-1 1650 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	17.4	2.71
NBUTANE	16.6	2.59
IPENTANE	20.1	3.12
NPENTANE	69.5	10.81
22-DMB	0.0	0.00
CPENTANE	6.7	1.04
23-DMB	5.9	0.91
2-MP	41.2	6.40
3-MP	18.8	2.92
NHEXANE	26.9	4.18
MCP	114.2	17.76
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	9.2	1.43
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	10.8	1.68
23-DMP ,	7.8	1.20
3-MHEX ,	11.5	1.78
1C3-DMCP	25.8	4.02

	TOTAL PPB	NORM PERCENT
1T3-DMCP	24.2	3.77
1T2-DMCP	59.7	9.27
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	38.5	5.98
1C2-DMCP	14.7	2.29
MCH	103.9	16.15

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	643.		C1/C2	0.52
GASOLINE	643.		A /D2	5.70
NAPHTHENES	358.	55.72	C1/D2	10.79
C6-7	447.	69.51	CH/MCP	0.08
			PENT/IPENT,	3.47

	PPB	NORM PERCENT
MCP	114.2	50.3
CH	9.2	4.0
MCH	103.9	45.7
TOTAL	227.3	100.0

PARAFFIN INDEX 1 0.203
PARAFFIN INDEX 2 13.201

18 AUG 82

72461S AUSTRALIA, KAHAWAI-1 1680 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	12.0	4.64
NPENTANE	25.9	10.01
22-DMB	0.0	0.00
CPENTANE	2.7	1.03
23-DMB	2.3	0.88
2-MP	19.5	7.52
3-MP	11.0	4.26
NHEXANE	15.4	5.96
MCP	42.3	16.35
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	2.4	0.91
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	5.7	2.20
23-DMP ,	2.2	0.85
3-MHEX ,	10.3	3.99
1C3-DMCP	10.3	3.99

	TOTAL PPB	NORM PERCENT
1T3-DMCP	8.2	3.17
1T2-DMCP	21.8	8.43
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	22.3	8.63
1C2-DMCP	0.0	0.00
MCH	44.5	17.18

	TOTALS PPB	NORM PERCENT
ALL COMP	259.	
GASOLINE	259.	
NAPHTHENES	132.	51.06
C6-7	186.	71.67

SIG COMP RATIOS	
C1/C2	0.64
A /D2	3.65
C1/D2	5.08
CH/MCP	0.06
PENT/IPENT,	2.16

	PPB	NORM PERCENT
MCP	42.3	47.5
CH	2.4	2.6
MCH	44.5	49.9
TOTAL	89.2	100.0

PARAFFIN INDEX 1	0.397
PARAFFIN INDEX 2	17.478

18 AUG 82

72461U AUSTRALIA, KAHAWAI-1 1710 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	3336.0	4.03
NBUTANE	2767.5	3.35
IPENTANE	5535.0	6.69
NPENTANE	2133.8	2.58
22-DMB	74.6	0.09
CPENTANE	816.8	0.99
23-DMB	688.9	0.83
2-MP	3548.1	4.29
3-MP	2179.8	2.64
NHEXANE	1377.4	1.67
MCP	16144.4	19.53
22-DMP	0.0	0.00
24-DMP	37.9	0.05
223-TMB	36.1	0.04
CHEXANE	2118.3	2.56
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	483.4	0.58
23-DMP ,	977.7	1.18
3-MHEX ,	1063.5	1.29
1C3-DMCP	5723.6	6.92
1T3-DMCP	3914.6	4.73
1T2-DMCP	9757.4	11.80
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	1440.1	1.74
1C2-DMCP	2677.8	3.24
MCH	15851.6	19.17

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	82684.		C1/C2	0.48
GASOLINE	82684.		A /D2	2.65
NAPHTHENES	57005.	68.94	C1/D2	17.35
C6-7	61604.	74.50	CH/MCP	0.13
			PENT/IPENT,	0.39

	PPB	NORM PERCENT
MCP	16144.4	47.3
CH	2118.3	6.2
MCH	15851.6	46.5
TOTAL	34114.3	100.0

PARAFFIN INDEX 1 0.080
PARAFFIN INDEX 2 3.484

18 AUG 82

72461W AUSTRALIA, KAHAWAI-1 1740 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	10.8	6.13
NPENTANE	21.4	12.12
22-DMB	0.7	0.39
CPENTANE	0.0	0.00
23-DMB	0.4	0.22
2-MP	11.5	6.51
3-MP	0.0	0.00
NHEXANE	0.0	0.00
MCP	0.0	0.00
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	22.3	12.64
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	4.0	2.24
23-DMP ,	4.9	2.80
3-MHEX ,	4.9	2.76
1C3-DMCP	7.4	4.18

	TOTAL PPB	NORM PERCENT
1T3-DMCP	5.5	3.11
1T2-DMCP	15.4	8.71
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	22.7	12.90
1C2-DMCP	0.0	0.00
MCH	44.5	25.28

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	176.		C1/C2	2.51
GASOLINE	176.		A /D2	4.67
NAPHTHENES	95.	53.93	C1/D2	14.55
C6-7	131.	74.63	CH/MCP	999.99
			PENT/IPENT,	1.98

	PPB	NORM PERCENT
MCP	0.0	0.0
CH	22.3	33.3
MCH	44.5	66.7
TOTAL	66.8	100.0

PARAFFIN INDEX 1 0.313
PARAFFIN INDEX 2 17.284

18 AUG 82

72461Y AUSTRALIA, KAHAWAI-1 1770 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	423.5	2.74
NBUTANE	401.3	2.59
IPENTANE	799.1	5.17
NPENTANE	414.1	2.68
22-DMB	21.9	0.14
CPENTANE	135.2	0.87
23-DMB	137.9	0.89
2-MP	637.0	4.12
3-MP	388.8	2.51
NHEXANE	318.4	2.06
MCP	2859.1	18.48
22-DMP	0.0	0.00
24-DMP	24.6	0.16
223-TMB	6.7	0.04
CHEXANE	347.8	2.25
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	133.8	0.87
23-DMP ,	209.5	1.35
3-MHEX ,	344.7	2.23
1C3-DMCP	944.8	6.11

	TOTAL PPB	NORM PERCENT
1T3-DMCP	884.0	5.72
1T2-DMCP	2062.3	13.33
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	366.8	2.37
1C2-DMCP	531.3	3.44
MCH	3074.7	19.88

	TOTALS PPB	NORM PERCENT
ALL COMP	15467.	
GASOLINE	15467.	
NAPHTHENES	10839.	70.08
C6-7	12109.	78.28

SIG COMP RATIOS

C1/C2	0.49
A /D2	1.99
C1/D2	10.32
CH/MCP	0.12
PENT/IPENT,	0.52

	PPB	NORM PERCENT
MCP	2859.1	45.5
CH	347.8	5.5
MCH	3074.7	48.9
TOTAL	6281.6	100.0

PARAFFIN INDEX 1 0.123
PARAFFIN INDEX 2 4.383

18 AUG 82

72462A AUSTRALIA, KAHAWAI-1 1800 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	16.7	0.74
NBUTANE	22.4	1.00
IPENTANE	82.5	3.66
NPENTANE	71.4	3.17
22-DMB	0.9	0.04
CPENTANE	17.9	0.79
23-DMB	17.1	0.76
2-MP	92.1	4.09
3-MP	59.1	2.63
NHEXANE	53.7	2.39
MCP	389.2	17.28
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	48.9	2.17
33-DMP	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX	21.2	0.94
23-DMP	26.9	1.19
3-MHEX	37.0	1.64
1C3-DMCP	214.2	9.51

	TOTAL PPB	NORM PERCENT
1T3-DMCP	125.0	5.55
1T2-DMCP	287.1	12.75
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	67.6	3.00
1C2-DMCP	41.1	1.83
MCH	559.7	24.85

	TOTALS PPB	NORM PERCENT
ALL COMP	2252.	
GASOLINE	2252.	
NAPHTHENES	1683.	74.74
C6-7	1872.	83.12

SIG COMP RATIOS

C1/C2	0.60
A /D2	3.28
C1/D2	17.02
CH/MCP	0.13
PENT/IPENT,	0.87

	PPB	NORM PERCENT
MCP	389.2	39.0
CH	48.9	4.9
MCH	559.7	56.1
TOTAL	997.8	100.0

PARAFFIN INDEX 1 0.093
PARAFFIN INDEX 2 4.869

18 AUG 82

72462C AUSTRALIA, KAHAWAI-1 1830 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	3394.2	8.85
NBUTANE	2069.7	5.40
IPENTANE	3910.7	10.20
NPENTANE	1528.8	3.99
22-DMB	80.6	0.21
CPENTANE	477.5	1.25
23-DMB	518.9	1.35
2-MP	2149.8	5.61
3-MP	967.9	2.52
NHEXANE	1006.2	2.62
MCP	6247.6	16.30
22-DMP	0.0	0.00
24-DMP	61.0	0.16
223-TMB	60.7	0.16
CHEXANE	989.4	2.58
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	266.2	0.69
23-DMP ,	596.8	1.56
3-MHEX ,	500.7	1.31
1C3-DMCP	2078.1	5.42
1T3-DMCP	1516.0	3.95
1T2-DMCP	2354.3	6.14
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	1093.8	2.85
1C2-DMCP	637.9	1.66
MCH	5831.5	15.21

	TOTALS PPB	NORM PERCENT
ALL COMP	38338.	
GASOLINE	38338.	
NAPHTHENES	20132.	52.51
C6-7	23240.	60.62

SIG COMP RATIOS	
C1/C2	0.55
A /D2	4.19
C1/D2	14.15
CH/MCP	0.16
PENT/IPENT,	0.39

	PPB	NORM PERCENT
MCP	6247.6	47.8
CH	989.4	7.6
MCH	5831.5	44.6
TOTAL	13068.5	100.0

PARAFFIN INDEX 1 0.129
PARAFFIN INDEX 2 7.183

18 AUG 82

72462E AUSTRALIA, KAHAWAI-1 1860 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	0.0	0.00
NPENTANE	0.0	0.00
22-DMB	0.0	0.00
CPENTANE	0.0	0.00
23-DMB	0.0	0.00
2-MP	0.0	0.00
3-MP	0.0	0.00
NHEXANE	0.0	0.00
MCP	0.0	0.00
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	0.0	0.00
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	0.0	0.00
23-DMP ,	0.0	0.00
3-MHEX ,	0.0	0.00
1C3-DMCP	0.0	0.00

	TOTAL PPB	NORM PERCENT
1T3-DMCP	0.0	0.00
1T2-DMCP	0.0	0.00
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	0.0	0.00
1C2-DMCP	0.0	0.00
MCH	0.0	0.00

	TOTALS PPB	NORM PERCENT
ALL COMP	0.	
GASOLINE	0.	
NAPHTHENES	0.	0.00
C6-7	0.	0.00

SIG COMP RATIOS

C1/C2	999.99
A /D2	999.99
C1/D2	999.99
CH/MCP	999.99
PENT/IPENT,	999.99

	PPB	NORM PERCENT
MCP	0.0	0.0
CH	0.0	0.0
MCH	0.0	0.0
TOTAL	0.0	0.0

PARAFFIN INDEX 1 0.000
PARAFFIN INDEX 2 0.000

18 AUG 82

724626 AUSTRALIA, KAHAWAI-1 1890 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	0.0	0.00
NPENTANE	0.0	0.00
22-DMB	0.0	0.00
CPENTANE	0.0	0.00
23-DMB	0.0	0.00
2-MP	0.0	0.00
3-MP	0.0	0.00
NHEXANE	0.0	0.00
MCP	0.0	0.00
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	0.0	0.00
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	0.0	0.00
23-DMP ,	0.0	0.00
3-MHEX ,	0.0	0.00
1C3-DMCP	0.0	0.00
1T3-DMCP	0.0	0.00
1T2-DMCP	0.0	0.00
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	0.0	0.00
1C2-DMCP	0.0	0.00
MCH	0.0	0.00

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	0.		C1/C2	999.99
GASOLINE	0.		A /D2	999.99
NAPHTHENES	0.	0.00	C1/D2	999.99
C6-7	0.	0.00	CH/MCP	999.99
			PENT/IPENT,	999.99

	PPB	NORM PERCENT
MCP	0.0	0.0
CH	0.0	0.0
MCH	0.0	0.0
TOTAL	0.0	0.0

PARAFFIN INDEX 1 0.000
PARAFFIN INDEX 2 0.000

18 AUG 82

724621 AUSTRALIA, KAHAWAI-1 1920 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	12759.4	13.00
NBUTANE	31661.4	32.26
IPENTANE	11021.0	11.23
NPENTANE	10874.1	11.08
22-DMB	63.4	0.06
CPENTANE	3767.5	3.84
23-DMB	68.9	0.07
2-MP	2144.9	2.19
3-MP	1315.5	1.34
NHEXANE	2354.6	2.40
MCP	6175.8	6.29
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	305.4	0.31
CHEXANE	4681.8	4.77
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	251.1	0.26
23-DMP ,	495.7	0.51
3-MHEX ,	453.3	0.46
1C3-DMCP	1029.8	1.05
1T3-DMCP	807.9	0.82
1T2-DMCP	1284.8	1.31
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	1327.4	1.35
1C2-DMCP	352.9	0.36
MCH	4944.3	5.04

	TOTALS PPB	NORM PERCENT
ALL COMP	98141.	
GASOLINE	98141.	
NAPHTHENES	23045.	23.48
C6-7	24465.	24.93

SIG COMP RATIOS	
C1/C2	1.02
A /D2	8.12
C1/D2	21.79
CH/MCP	0.76
PENT/IPENT,	0.99

	PPB	NORM PERCENT
MCP	6175.8	39.1
CH	4681.8	29.6
MCH	4944.3	31.3
TOTAL	15801.9	100.0

PARAFFIN INDEX 1 0.226
PARAFFIN INDEX 2 8.689

18 AUG 82

72462K AUSTRALIA, KAHAWAI-1 1950 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	89.3	5.25
NBUTANE	275.6	16.20
IPENTANE	252.8	14.86
NPENTANE	244.4	14.37
22-DMB	2.2	0.13
CPENTANE	22.5	1.32
23-DMB	12.6	0.74
2-MP	74.2	4.36
3-MP	38.7	2.27
NHEXANE	93.3	5.48
MCP	104.1	6.12
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	112.6	6.62
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	14.6	0.86
23-DMP ,	12.9	0.76
3-MHEX ,	14.6	0.86
1C3-DMCP	18.5	1.09

	TOTAL PPB	NORM PERCENT
1T3-DMCP	17.3	1.01
1T2-DMCP	25.7	1.51
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	78.1	4.59
1C2-DMCP	0.0	0.00
MCH	196.9	11.58

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	1701.		C1/C2	1.96
GASOLINE	1701.		A /D2	11.74
NAPHTHENES	498.	29.26	C1/D2	22.21
C6-7	688.	40.48	CH/MCP	1.08
			PENT/IPENT,	0.97

	PPB	NORM PERCENT
MCP	104.1	25.2
CH	112.6	27.2
MCH	196.9	47.6
TOTAL	413.6	100.0

PARAFFIN INDEX 1 0.475
PARAFFIN INDEX 2 15.892

18 AUG 82

72462M AUSTRALIA, KAHAWAI-1 1980 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	26.7	4.36
NBUTANE	107.3	17.55
IPENTANE	57.3	9.37
NPENTANE	147.3	24.09
22-DMB	0.8	0.14
CPENTANE	5.2	0.86
23-DMB	4.4	0.72
2-MP	28.1	4.60
3-MP	16.6	2.71
NHEXANE	35.7	5.84
MCP	33.7	5.51
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	42.0	6.87
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	4.1	0.67
23-DMP ,	0.0	0.00
3-MHEX ,	2.8	0.46
1C3-DMCP	3.3	0.53

	TOTAL PPB	NORM PERCENT
1T3-DMCP	2.6	0.42
1T2-DMCP	5.6	0.92
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	24.1	3.94
1C2-DMCP	0.0	0.00
MCH	63.8	10.43

	TOTALS PPB	NORM PERCENT
ALL COMP	611.	
GASOLINE	611.	
NAPHTHENES	156.	25.54
C6-7	218.	35.60

SIG COMP RATIOS	
C1/C2	2.43
A /D2	21.27
C1/D2	39.08
CH/MCP	1.25
PENT/IPENT,	2.57

	PPB	NORM PERCENT
MCP	33.7	24.1
CH	42.0	30.1
MCH	63.8	45.7
TOTAL	139.5	100.0

PARAFFIN INDEX 1 0.603
PARAFFIN INDEX 2 16.247

18 AUG 82

724620 AUSTRALIA, KAHAWAI-1 2010 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	109.1	17.98
NBUTANE	14.7	2.42
IPENTANE	63.2	10.42
NPENTANE	77.6	12.79
22-DMB	0.0	0.00
CPENTANE	5.9	0.96
23-DMB	4.6	0.76
2-MP	34.7	5.73
3-MP	22.9	3.77
NHEXANE	52.2	8.61
MCP	34.4	5.66
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	51.6	8.51
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	3.6	0.60
23-DMP ,	0.0	0.00
3-MHEX ,	6.0	0.99
1C3-DMCP	3.0	0.50

	TOTAL PPB	NORM PERCENT
1T3-DMCP	1.6	0.26
1T2-DMCP	6.3	1.04
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	25.3	4.17
1C2-DMCP	0.0	0.00
MCH	89.9	14.82

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	607.		C1/C2	3.20
GASOLINE	607.		A /D2	12.91
NAPHTHENES	193.	31.76	C1/D2	24.18
C6-7	274.	45.16	CH/MCP	1.50
			PENT/IPENT,	1.23

	PPB	NORM PERCENT
MCP	34.4	19.5
CH	51.6	29.3
MCH	89.9	51.1
TOTAL	175.9	100.0

PARAFFIN INDEX 1 0.882
PARAFFIN INDEX 2 13.505

18 AUG 82

724620 AUSTRALIA, KAHAWAI-1 2040 M.

	TOTAL PPB	NORM PERCENT		TOTAL PPB	NORM PERCENT
METHANE	0.0		1T3-DMCP	116.9	1.36
ETHANE	0.0		1T2-DMCP	204.2	2.37
PROPANE	0.0		3-EPENT	0.0	0.00
IBUTANE	233.7	2.71	224-TMP	0.0	0.00
NBUTANE	682.6	7.91	NHEPTANE	493.0	5.72
IPENTANE	731.7	8.48	1C2-DMCP	22.8	0.26
NPENTANE	964.4	11.18	MCH	1833.7	21.26
22-DMB	19.4	0.22			
CPENTANE	93.7	1.09			
23-DMB	89.0	1.03			
2-MP	623.7	7.23			
3-MP	312.1	3.62			
NHEXANE	200.3	2.32			
MCP	658.5	7.63			
22-DMP	0.0	0.00			
24-DMP	19.7	0.23			
223-TMB	2.6	0.03			
CHEXANE	703.7	8.16			
33-DMP ,	0.0	0.00			
11-DMCP	0.0	0.00			
2-MHEX ,	187.4	2.17			
23-DMP ,	103.2	1.20			
3-MHEX ,	209.5	2.43			
1C3-DMCP	119.1	1.38			

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	8625.		C1/C2	2.43
GASOLINE	8625.		A /D2	3.31
NAPHTHENES	3753.	43.51	C1/D2	13.00
C6-7	4875.	56.52	CH/MCP	1.07
			PENT/IPENT,	1.32

	PPB	NORM PERCENT
MCP	658.5	20.6
CH	703.7	22.0
MCH	1833.7	57.4
TOTAL	3195.9	100.0

PARAFFIN INDEX 1 0.902
PARAFFIN INDEX 2 12.416

18 AUG 82

72462S AUSTRALIA, KAHAWAI-1 2070 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	124.4	2.06
NBUTANE	542.8	8.98
IPENTANE	531.5	8.79
NPENTANE	931.5	15.40
22-DMB	13.9	0.23
CPENTANE	58.6	0.97
23-DMB	61.7	1.02
2-MP	439.7	7.27
3-MP	224.0	3.71
NHEXANE	80.3	1.33
MCP	406.9	6.73
22-DMP	0.0	0.00
24-DMP	10.3	0.17
223-TMB	0.0	0.00
CHEXANE	521.7	8.63
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	129.4	2.14
23-DMP ,	65.4	1.08
3-MHEX ,	89.0	1.47
1C3-DMCP	61.9	1.02

	TOTAL PPB	NORM PERCENT
1T3-DMCP	91.7	1.52
1T2-DMCP	87.5	1.45
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	280.4	4.64
1C2-DMCP	12.5	0.21
MCH	1281.9	21.20

	TOTALS PPB	NORM PERCENT
ALL COMP	6047.	
GASOLINE	6047.	
NAPHTHENES	2523.	41.72
C6-7	3119.	51.58

SIG COMP RATIOS

C1/C2	2.93
A /D2	4.05
C1/D2	21.72
CH/MCP	1.28
PENT/IPENT,	1.75

	PPB	NORM PERCENT
MCP	406.9	18.4
CH	521.7	23.6
MCH	1281.9	58.0
TOTAL	2210.5	100.0

PARAFFIN INDEX 1	0.906
PARAFFIN INDEX 2	10.747

18 AUG 82

72462U AUSTRALIA, KAHAWAI-1 2100 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	150.5	3.82
NBUTANE	441.9	11.22
IPENTANE	387.2	9.83
NPENTANE	409.4	10.39
22-DMB	7.8	0.20
CPENTANE	48.4	1.23
23-DMB	36.1	0.92
2-MP	243.7	6.18
3-MP	126.3	3.21
NHEXANE	320.3	8.13
MCP	312.6	7.93
22-DMP	0.0	0.00
24-DMP	7.1	0.18
223-TMB	0.0	0.00
CHEXANE	229.5	5.82
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	84.0	2.13
23-DMP ,	37.9	0.96
3-MHEX ,	51.4	1.30
1C3-DMCP	55.3	1.40

	TOTAL PPB	NORM PERCENT
1T3-DMCP	78.3	1.99
1T2-DMCP	74.3	1.89
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	151.6	3.85
1C2-DMCP	11.6	0.30
MCH	675.0	17.13

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	3940.		C1/C2	1.86
GASOLINE	3940.		A /D2	9.19
NAPHTHENES	1485.	37.69	C1/D2	19.24
C6-7	2089.	53.01	CH/MCP	0.73
			PENT/IPENT,	1.06

	PPB	NORM PERCENT
MCP	312.6	25.7
CH	229.5	18.9
MCH	675.0	55.5
TOTAL	1217.1	100.0

PARAFFIN INDEX 1 0.651
PARAFFIN INDEX 2 10.549

18 AUG 82

72462W AUSTRALIA, KAHAWAI-1 2130 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	968.2	3.63
NBUTANE	3022.7	11.32
IPENTANE	3248.5	12.17
NPENTANE	3837.8	14.38
22-DMB	77.9	0.29
CPENTANE	527.2	1.97
23-DMB	288.4	1.08
2-MP	1601.1	6.00
3-MP	810.2	3.04
NHEXANE	1709.6	6.40
MCP	2326.1	8.71
22-DMP	0.0	0.00
24-DMP	8.5	0.03
223-TMB	66.6	0.25
CHEXANE	3015.4	11.30
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	123.0	0.46
23-DMP ,	202.5	0.76
3-MHEX ,	141.7	0.53
1C3-DMCP	328.6	1.23

	TOTAL PPB	NORM PERCENT
1T3-DMCP	256.1	0.96
1T2-DMCP	444.9	1.67
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	381.7	1.43
1C2-DMCP	128.3	0.48
MCH	3179.8	11.91

	TOTALS PPB	NORM PERCENT
ALL COMP	26695.	
GASOLINE	26695.	
NAPHTHENES	10206.	38.23
C6-7	12313.	46.12

SIG COMP RATIOS

C1/C2	1.81
A /D2	14.75
C1/D2	44.58
CH/MCP	1.30
PENT/IPENT,	1.18

	PPB	NORM PERCENT
MCP	2326.1	27.3
CH	3015.4	35.4
MCH	3179.8	37.3
TOTAL	8521.3	100.0

PARAFFIN INDEX 1 0.257
PARAFFIN INDEX 2 4.727

18 AUG 82

72462Y AUSTRALIA, KAHAWAI-1 2160 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	77.6	3.23
NBUTANE	266.1	11.06
IPENTANE	221.8	9.22
NPENTANE	307.5	12.78
22-DMB	5.0	0.21
CPENTANE	35.8	1.49
23-DMB	23.0	0.96
2-MP	141.8	5.89
3-MP	74.9	3.11
NHEXANE	197.6	8.21
MCP	209.2	8.69
22-DMP	0.0	0.00
24-DMP	0.0	0.00
223-TMB	0.0	0.00
CHEXANE	176.7	7.34
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	51.0	2.12
23-DMP ,	19.4	0.81
3-MHEX ,	23.3	0.97
1C3-DMCP	32.1	1.34

	TOTAL PPB	NORM PERCENT
1T3-DMCP	41.0	1.70
1T2-DMCP	36.7	1.53
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	92.9	3.86
1C2-DMCP	4.5	0.19
MCH	368.1	15.30

	TOTALS PPB	NORM PERCENT
ALL COMP	2406.	
GASOLINE	2406.	
NAPHTHENES	904.	37.58
C6-7	1252.	52.06

SIG COMP RATIOS	
C1/C2	1.84
A /D2	12.45
C1/D2	25.54
CH/MCP	0.84
PENT/IPENT,	1.39

	PPB	NORM PERCENT
MCP	209.2	27.7
CH	176.7	23.4
MCH	368.1	48.8
TOTAL	754.0	100.0

PARAFFIN INDEX 1 0.677
PARAFFIN INDEX 2 11.040

18 AUG 82

72463A AUSTRALIA, KAHAWAI-1 2190 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	70.1	3.48
NBUTANE	217.1	10.77
IPENTANE	286.5	14.22
NPENTANE	249.3	12.37
22-DMB	5.4	0.27
CPENTANE	29.8	1.48
23-DMB	20.5	1.02
2-MP	112.5	5.58
3-MP	56.2	2.79
NHEXANE	131.6	6.53
MCP	155.0	7.69
22-DMP	0.0	0.00
24-DMP	3.2	0.16
223-TMB	0.0	0.00
CHEXANE	143.1	7.10
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	60.7	3.01
23-DMP ,	19.2	0.95
3-MHEX ,	22.6	1.12
1C3-DMCP	18.3	0.91

	TOTAL PPB	NORM PERCENT
1T3-DMCP	16.4	0.81
1T2-DMCP	28.3	1.40
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	133.8	6.64
1C2-DMCP	0.0	0.00
MCH	235.7	11.69

	TOTALS PPB	NORM PERCENT
ALL COMP	2015.	
GASOLINE	2015.	
NAPHTHENES	627.	31.09
C6-7	968.	48.03

SIG COMP RATIOS

C1/C2	2.02
A /D2	11.71
C1/D2	19.41
CH/MCP	0.92
PENT/IPENT,	0.87

	PPB	NORM PERCENT
MCP	155.0	29.0
CH	143.1	26.8
MCH	235.7	44.1
TOTAL	533.8	100.0

PARAFFIN INDEX 1 1.323
PARAFFIN INDEX 2 19.724

18 AUG 82

72463C AUSTRALIA, KAHAWAI-1 2220 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	90825.1	
PROPANE	42976.2	
IBUTANE	98036.6	15.92
NBUTANE	72589.2	11.79
IPENTANE	33911.3	5.51
NPENTANE	33908.5	5.51
22-DMB	351.7	0.06
CPENTANE	3980.5	0.65
23-DMB	8131.5	1.32
2-MP	14813.9	2.41
3-MP	24725.9	4.01
NHEXANE	16589.9	2.69
MCP	40785.1	6.62
22-DMP	0.0	0.00
24-DMP	40014.1	6.50
223-TMB	6705.9	1.09
CHEXANE	57896.0	9.40
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	6740.7	1.09
23-DMP ,	6249.3	1.01
3-MHEX ,	7723.0	1.25
1C3-DMCP	3873.5	0.63

	TOTAL PPB	NORM PERCENT
1T3-DMCP	4543.7	0.74
1T2-DMCP	8766.9	1.42
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	21063.5	3.42
1C2-DMCP	0.0	0.00
MCH	104496.0	16.97

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	749697.		C1/C2	2.92
GASOLINE	615896.		A /D2	4.88
NAPHTHENES	224342.	36.43	C1/D2	21.90
C6-7	325447.	52.84	CH/MCP	1.42
			PENT/IPENT,	1.00

	PPB	NORM PERCENT
MCP	40785.1	20.1
CH	57896.0	28.5
MCH	104496.0	51.4
TOTAL	203177.1	100.0

PARAFFIN INDEX 1 0.842
PARAFFIN INDEX 2 9.516

18 AUG 82

72463E AUSTRALIA, KAHAWAI-1 2250 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	614.2	
PROPANE	3095.9	
IBUTANE	3675.4	3.41
NBUTANE	10025.5	9.29
IPENTANE	10621.8	9.85
NPENTANE	11055.0	10.25
22-DMB	264.8	0.25
CPENTANE	1983.8	1.84
23-DMB	1030.3	0.96
2-MP	6459.9	5.99
3-MP	3209.9	2.98
NHEXANE	6752.0	6.26
MCP	8789.2	8.15
22-DMP	0.0	0.00
24-DMP	143.8	0.13
223-TMB	1065.8	0.99
CHEXANE	10992.3	10.19
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	1064.2	0.99
23-DMP ,	1264.6	1.17
3-MHEX ,	1295.3	1.20
1C3-DMCP	1318.5	1.22

	TOTAL PPB	NORM PERCENT
1T3-DMCP	1182.3	1.10
1T2-DMCP	2112.6	1.96
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	3368.0	3.12
1C2-DMCP	850.6	0.79
MCH	19353.9	17.94

	TOTALS PPB	NORM PERCENT
ALL COMP	111589.	
GASOLINE	107879.	
NAPHTHENES	46583.	43.18
C6-7	59553.	55.20

SIG COMP RATIOS	
C1/C2	2.20
A /D2	7.81
C1/D2	24.25
CH/MCP	1.25
PENT/IPENT,	1.04

	PPB	NORM PERCENT
MCP	8789.2	22.5
CH	10992.3	28.1
MCH	19353.9	49.5
TOTAL	39135.4	100.0

PARAFFIN INDEX 1 0.511
PARAFFIN INDEX 2 8.028

18 AUG 82

724630 AUSTRALIA, KAHAWAI-1 2280 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	589.3	
PROPANE	1202.5	
IBUTANE	1526.2	4.09
NBUTANE	3942.9	10.56
IPENTANE	3606.0	9.66
NPENTANE	3833.0	10.27
22-DMB	86.7	0.23
CPENTANE	348.5	0.93
23-DMB	336.1	0.90
2-MP	2205.4	5.91
3-MP	1087.3	2.91
NHEXANE	3135.9	8.40
MCP	2332.8	6.25
22-DMP	0.0	0.00
24-DMP	59.1	0.16
223-TMB	101.2	0.27
CHEXANE	2724.9	7.30
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	586.6	1.57
23-DMP ,	429.1	1.15
3-MHEX ,	578.3	1.55
1C3-DMCP	424.5	1.14

	TOTAL PPB	NORM PERCENT
1T3-DMCP	391.6	1.05
1T2-DMCP	730.7	1.96
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	2090.3	5.60
1C2-DMCP	77.7	0.21
MCH	6690.4	17.92

	TOTALS PPB	NORM PERCENT	SIG COMP RATIOS	
ALL COMP	39117.		C1/C2	2.53
GASOLINE	37325.		A /D2	9.04
NAPHTHENES	13721.	36.76	C1/D2	17.30
C6-7	20353.	54.53	CH/MCP	1.17
			PENT/IPENT,	1.06

	PPB	NORM PERCENT
MCP	2332.8	19.9
CH	2724.9	23.2
MCH	6690.4	56.9
TOTAL	11748.1	100.0

PARAFFIN INDEX 1	0.753
PARAFFIN INDEX 2	14.272

18 AUG 82

72463I AUSTRALIA, KAHAWAI-1 2310 M.

	TOTAL PPB	NORM PERCENT
METHANE	0.0	
ETHANE	0.0	
PROPANE	0.0	
IBUTANE	0.0	0.00
NBUTANE	0.0	0.00
IPENTANE	3425.4	15.18
NPENTANE	2633.6	11.67
22-DMB	48.3	0.21
CPENTANE	462.5	2.05
23-DMB	230.6	1.02
2-MP	1330.0	5.89
3-MP	748.8	3.32
NHEXANE	1092.7	4.84
MCP	2681.1	11.88
22-DMP	0.0	0.00
24-DMP	22.0	0.10
223-TMB	73.6	0.33
CHEXANE	1909.7	8.46
33-DMP ,	0.0	0.00
11-DMCP	0.0	0.00
2-MHEX ,	274.5	1.22
23-DMP ,	274.7	1.22
3-MHEX ,	326.2	1.45
1C3-DMCP	503.6	2.23

	TOTAL PPB	NORM PERCENT
1T3-DMCP	416.8	1.85
1T2-DMCP	723.3	3.20
3-EPENT	0.0	0.00
224-TMP	0.0	0.00
NHEPTANE	736.9	3.27
1C2-DMCP	264.7	1.17
MCH	4390.1	19.45

	TOTALS PPB	NORM PERCENT
ALL COMP	22569.	
GASOLINE	22569.	
NAPHTHENES	11352.	50.30
C6-7	13690.	60.66

SIG COMP RATIOS	
C1/C2	1.43
A /D2	5.61
C1/D2	20.15
CH/MCP	0.71
PENT/IPENT,	0.77

	PPB	NORM PERCENT
MCP	2681.1	29.9
CH	1909.7	21.3
MCH	4390.1	48.9
TOTAL	8980.9	100.0

PARAFFIN INDEX 1 0.365
PARAFFIN INDEX 2 7.712

APPENDIX - 2

Detailed Vitrinite Reflectance and Exinite Fluorescence Data

by

A.C. Cook.

APPENDIX-2, by A.C. Cook.

KAHAWAI No. 1

KK No.	Esso No.	Depth m	$\bar{R}_v$ max %	Range R_v max %	N	Exinite fluorescence (Remarks)
			LATROBE GROUP			
15895	BS/K1	1604.2 SWC	0.48	0.41-0.62	25	Abundant sporinite, resinite and liptodetrinite, yellow to orange. (Coal, rich in inertinite, approx. 55-75% V, 20-40% I, 5-10% E. Telocollinite and a range of inertinite macerals present. Facies similar to the "Lower Eastern View" coals. Vitrinite is texturally immature. Siderite common, pyrite rare.)
15896	BS/K2	1808.5 SWC	0.36	0.30-0.56	20	Sparse sporinite, yellow to orange. (Siltstone with d.o.m. common to abundant, I>V>E. Vitrinite common occurring as small phytoclasts. The large range is due to the presence of transitions to suberinite and to macrinite. Inertinite common. Abundant framboidal pyrite.)
15897	BS/K3	2120.4 SWC	0.49	0.38-0.54	20	Exinite sparse to common, sporinite>?dinoflagellates>resinite. Sporinite yellow to orange. ?Dinoflagellates bright yellow. (Siltstone with d.o.m. abundant. Vitrinite common to abundant, occurring as extensive layers of telocollinite. Inertinite common, as small phytoclasts. Pyrite present.)

APPENDIX 6

Appendix 6

APPENDIX 6

SYNTHETIC SEISMIC TRACE

SYNTHETIC SEISMIC TRACE

The synthetic seismic trace was generated over the depth interval of 200m to 2300m subsea by convolving a second derivative gaussian function (zero-phase) of 25hz with the reflection coefficient series. The polarity convention used represents a positive reflection coefficient as a trough. No account is taken of transmission losses or multiple ray paths.

The reflection coefficient series was calculated from the acoustic impedance at 2m intervals. The sonic and density logs (where available) are thus blocked at 2m intervals. The density log was kept constant at 2.2 gr/cc from 200m to 770m subsea. No editing was performed on either log.

PE902656

This is an enclosure indicator page.
The enclosure PE902656 is enclosed within the container PE902654 at this location in this document.

The enclosure PE902656 has the following characteristics:

ITEM_BARCODE =	PE902656
CONTAINER_BARCODE =	PE902654
NAME =	Velocity Check Shot survey
BASIN =	GIPPSLAND
PERMIT =	
TYPE =	WELL
SUBTYPE =	SYNTH_SEISMOGRAM
DESCRIPTION =	Velocity Check Shot survey(enclosure from WCR vol.2) for Kahawai-1
REMARKS =	
DATE_CREATED =	25/03/1983
DATE_RECEIVED =	02/05/1983
W_NO =	W776
WELL_NAME =	Kahawi-1
CONTRACTOR =	ESSO
CLIENT_OP_CO =	ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

ENCLOSURES

ENCLOSURES.

PE902657

This is an enclosure indicator page.
The enclosure PE902657 is enclosed within the container PE902654 at this location in this document.

The enclosure PE902657 has the following characteristics:

ITEM_BARCODE =	PE902657
CONTAINER_BARCODE =	PE902654
NAME =	Structure Map top of Latrobe group
BASIN =	GIPPSLAND
PERMIT =	
TYPE =	SEISMIC
SUBTYPE =	HRZN_CONTR_MAP
DESCRIPTION =	Structure Map top of Latrobe group (enclosure from WCR vol.2) for Kahawai-1
REMARKS =	
DATE_CREATED =	31/01/1983
DATE_RECEIVED =	02/05/1986
W_NO =	W776
WELL_NAME =	Kahawi-1
CONTRACTOR =	ESSO
CLIENT_OP_CO =	ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902658

This is an enclosure indicator page.
The enclosure PE902658 is enclosed within the container PE902654 at this location in this document.

The enclosure PE902658 has the following characteristics:

ITEM_BARCODE =	PE902658
CONTAINER_BARCODE =	PE902654
NAME =	Structure Map top of Coarse Clastics
BASIN =	GIPPSLAND
PERMIT =	
TYPE =	SEISMIC
SUBTYPE =	HRZN_CONTR_MAP
DESCRIPTION =	Structure Map top of Coarse Clastics (enclosure from WCR vol.2) for Kahawai-1
REMARKS =	
DATE_CREATED =	28/02/1983
DATE_RECEIVED =	02/05/1983
W_NO =	W776
WELL_NAME =	Kahawi-1
CONTRACTOR =	ESSO
CLIENT_OP_CO =	ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902659

This is an enclosure indicator page.
The enclosure PE902659 is enclosed within the container PE902654 at this location in this document.

The enclosure PE902659 has the following characteristics:

ITEM_BARCODE = PE902659
CONTAINER_BARCODE = PE902654
NAME = Structure Map Base of Eocene Channel
BASIN = GIPPSLAND
PERMIT =
TYPE = SEISMIC
SUBTYPE = HRZN_CONTR_MAP
DESCRIPTION = Structure Map Base of Eocene Channel (enclosure from WCR vol.2) for Kahawai-1
REMARKS =
DATE_CREATED = 31/01/1983
DATE_RECEIVED = 02/05/1983
W_NO = W776
WELL_NAME = Kahawi-1
CONTRACTOR = ESSO
CLIENT_OP_CO = ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902660

This is an enclosure indicator page.
The enclosure PE902660 is enclosed within the container PE902654 at this location in this document.

The enclosure PE902660 has the following characteristics:

```
     ITEM_BARCODE = PE902660
CONTAINER_BARCODE = PE902654
             NAME = Cross Section A-A' map
            BASIN = GIPPSLAND
           PERMIT =
             TYPE = WELL
          SUBTYPE = CROSS_SECTION
      DESCRIPTION = Cross Section A-A' map (enclosure from
                    WCR vol.2) for Kahawai-1
          REMARKS =
     DATE_CREATED = 31/12/1982
    DATE_RECEIVED = 02/05/1983
             W_NO = W776
        WELL_NAME = Kahawi-1
       CONTRACTOR = ESSO
     CLIENT_OP_CO = ESSO
```

(Inserted by DNRE - Vic Govt Mines Dept)

PE601340

This is an enclosure indicator page.
The enclosure PE601340 is enclosed within the container PE902654 at this location in this document.

The enclosure PE601340 has the following characteristics:

ITEM_BARCODE = PE601340
CONTAINER_BARCODE = PE902654
NAME = Well Completion Log
BASIN = GIPPSLAND
PERMIT =
TYPE = WELL
SUBTYPE = COMPLETION_LOG
DESCRIPTION = Well Completion Log (enclosure from WCR vol.2) for Kahawai-1
REMARKS =
DATE_CREATED = 19/06/1982
DATE_RECEIVED = 02/05/1983
W_NO = W776
WELL_NAME = Kahawi-1
CONTRACTOR = SCHLUMBERGER
CLIENT_OP_CO = ESSO

(Inserted by DNRE - Vic Govt Mines Dept)